

NOVEMBER, 1947

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING

WARM AIR HEATING

SHEET METAL CONTRACTING

In This Issue

Continuous Air Circulation is the new name for continuous blower operation. On Page 81 Prof. Konzo describes five steps to this new concept of *Indoor Comfort*. Complete in this issue, you can take it right out on the job and follow "Five Checks for Comfort Dividends."

Many contractors will welcome the ideas for sales letters on Page 73. Written by David Markstein, the article is packed with ideas that make letters sell.

The reprinting of Duct-work Estimating Tables on Page 90 is by request. The new tables, revised by E. B. Root, will be completed in three installments.

Equipment Developments are always interesting reading. Here you learn about What's New. New things on parade. Turn to Page 120.

The Cover Picture

New Museum of Modern Art, New York City, Street Floor all Stainless Steel except windows.



AIR CONTROL STACKHEAD DAMPERS

Give you micrometer adjustment on your forced air installation



AIR STACKHEAD DAMPER IN AIR DUCT

SCREW THRU HOLES IN TOP FLANGE

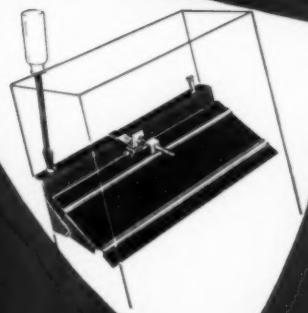
Just one man with a screw driver and a volumeter, or a micrometer, can balance out a heating system to micrometer accuracy. The butterfly damper is adjusted by means of screw mechanism that gives positive and accurate control of the air volume.

AIR CONTROL Stackhead Dampers are installed in the stackhead throat. It is a completely assembled unit that needs no locating holes or alignment. Just place it in the stackhead throat and hold it in place with two screws, or it may be attached to stackhead in your shop with two rivets.

Saves time! One man does the work of two—Saves money!—costs less than the parts and labor on the old type basement style damper, offers less air resistance and gives even air distribution across face of register. Can be easily installed on old installations where a troublesome run needs dampering.

Available for any standard stackhead. Sizes 6", 8", 10", 12" (use 2 in 24" head) 14", 15" (use 2 in 30" head).

See your AIR CONTROL Jobber today—he has them in stock, along with AIR CONTROL'S complete line of Registers, Grilles, Floor Registers, etc.



ADJUST BEFORE OR AFTER DAMPER IS PLACED IN WALL



AIR CONTROL PRODUCTS, INC.
COOPERSVILLE MICHIGAN

FREE! NEW COMBINATION Ball Point Pen and Key Chain!

To acquaint as many jobbers and dealers as possible with the superior features of Wilson's Hair Filters, Wilson & Co. is offering these new, unique Ball Point Pens and Key Chains, *Absolutely Free!* Merely sign this coupon requesting information and send to address at bottom of this page. This offer will expire February 1st, 1948. A-11

Please tell us about Wilson's Hair Filters.

Name

Address

City, State



1/3 actual size

TO SEE WHY

WILSON'S HAIR FILTER

IS BOOMING DEALER SALES

Get your FREE SAMPLE!

SEE OUR EXHIBIT
at the Eighth Air Conditioning Exposition
Grand Central Palace,
New York
February 2-6, 1948

Naturally it's easy for the public to see that *natural hair* would do the best job of filtering the air. It's nature's way in the nose and ears. And Wilson's Hair Filter in its smart "honeycomb" replacement unit sure has eye-appeal. It's the smart thing for you to sell and the smart thing for home and building owners to use. And *that* combination means sales and repeat sales. Send for your free sample and our proposition today.



Wilson & Co., Inc. (Air Filter Division)
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WILSON'S HAIR FILTER

AMERICAN ARTISAN

RESIDENTIAL
AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

Member—Audit Bureau of Circulations
Member—Associated Business Papers

MANAGEMENT

EDITORIAL—ARE RESTRICTIONS RETURNING?	69
KRUCKMAN—STATE OF THE UNION	70
NEWS SUMMARY OF THE MONTH	72
LET THE POSTMAN RING YOUR SALES BELL!	73
WAGE INCENTIVE PLANS (II)	74
BANK CREDIT IS BEING MODERNIZED	77

RESIDENTIAL AIR CONDITIONING

FIVE CHECKS FOR COMFORT DIVIDENDS—KONZO	81
DUCTWORK ESTIMATING TABLES	90
OPEN FOR DISCUSSION	94

SHEET METAL CONTRACTING

PRODUCTION BY DEPARTMENTS AIDS SHEET METAL FABRICATOR	97
TOOLS AND THEIR USES (V)	99
DESIGN OF WASTE REMOVAL SYSTEMS (III)	103
NEUBECKER—TRANSITIONAL COMPOUND OFFSET	104
THE IDEA EXCHANGE	106

DEPARTMENTS

THE EDITOR'S NOTEBOOK	6
ASSOCIATION ACTIVITIES	109
EQUIPMENT DEVELOPMENTS	120
NEW LITERATURE	140
WITH THE CONTRACTORS	144
WITH THE MANUFACTURERS	150

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

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Founded 1880

NOVEMBER, 1947

Volume 116, No. 11

AMERICAN ARTISAN, November, 1947

SYNEROMATIC



COAL-FIRED CFB
In Gravity or Forced Air
75,000 to 250,000 B.T.U.s

GAS-FIRED GFB
A Heavy-Gauge Steel—In all
sizes for Natural, Manufactured
and Butane Gas

Na Sir!
FURNACES are
NOT ALL ALIKE
You Just Can't Beat

~~Syncromatic~~
for COUNTER FLOW DESIGN
ECONOMY
PERFORMANCE
BEAUTY AND
EASE OF OPERATION



↑
OIL-FIRED UNIT OF
showing COUNTERFLOW design that utilizes
heat units to best advantage.



Syncromatic Corporation
WATERTOWN, WISCONSIN



Precision-built Sampsel controls never become "orphans". If a Sampsel Control becomes accidentally damaged, or needs modernization after years of service, there's no need to load it onto your own busy servicemen — it's more profitable to keep them working on new installations. That's why Sampsel maintains a completely equipped Modernization Department, manned by factory craftsmen. It's at your service, ready to put any Sampsel-built product into "brand new" condition economically.



Service By Return Mail

Within a few hours after any Sampsel unit is received for service, a rebuilt and re-conditioned model in perfect condition is on its way back to you. This modern "Exchange" Service saves you many days, keeps your customers happy!



Complete Modernization

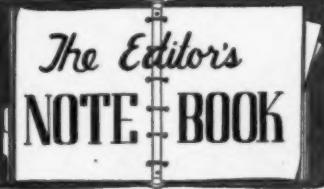
Where improvements in design have been made in the original model, the exchange unit returned will include new parts. Units are completely cleaned, repaired, modernized and retested individually.

Write for full information on the complete Sampsel line of precision-built automatic controls for modern home heating systems.

Sampsel

AUTOMATIC CONTROLS

SAMPSSEL TIME CONTROL, INC. • Spring Valley, Illinois
CANADIAN SALES DISTRIBUTOR: PEASE FOUNDRY CO., LTD., Toronto, Can.



We Have a Moral Responsibility

From NWAH&ACA headquarters comes a warning by Managing Director George Boedner calling attention to the complaints Better Business Bureaus in various parts of the country are receiving from persons who have installed oil heating equipment and cannot obtain a contract with an oil company for their winter's supply of fuel oil. Continuing, he said:

"We in the warm air heating industry have a moral as well as a business responsibility in establishing a policy of acquainting prospective customers relative to the local fuel situation, before changing over from one fuel to another. Not to do so will redound against the industry as a whole and might result in some prospective purchasers of heating equipment in coming years to turn to systems other than warm air."

"The National Warm Air Heating and Air Conditioning Association has been striving for years, thru its warm air research and other activities, to assist in developing good public relations. The warm air heating industry enjoys good public relations today, and that is demonstrated by 9 million installations in the country. The way to maintain good public relations is to be perfectly frank with consumers relative to your local fuel situation."

Our National Heritage

It seems reasonably clear that the national patrimony of the people of the United States has been dissipated in recent years, and is still being dissipated, at a rate never before seen in our history.—WALTER E. SPAHR, *The Tax Review*.

How It's Done!

Adherents of free enterprise are pointing to the Census Bureau report that over 60 million Americans had civilian jobs last June, compared with the 60 million Henry Wallace hoped to have working by 1950 under his "full employment" plan.

They note that Wallace's goal was beaten by three years—not under his plan of government controls and planned management of the national economy, but under the time-tested free enterprise system.

Right Now!

Right now is the time to adjust all fuel burners to the highest efficiency—to save fuel—to ease the load on our transportation facilities.



they're tired of waiting

Build Profitable Furnace Sales NOW!

Shortages and restrictions on other fuels are causing thousands to install a modern coal-fired furnace now. Many others must replace obsolete heating plants yet this season. It means a longer selling season for you — and an opportunity to cash in on the only coal-fired furnace with Integral Heating Element.* The Weir "U" Series furnace offers the first major improvements in years. Permanently leak-proof for greater cleanliness. Never needs recementing. Simple, easy installation. Greater efficiency and finer performance gives new economy. Write for franchise details. Find out why "WEIR-MEYER means modern heat".

*Pat. applied for.



Integral Heating Element "shipped with doors attached. Doors and seats are surface ground for perfect fit. Welded steel element is leakproof.

Pressed steel front slides snugly over pouch. Front is not exposed to fire. Casing hooks tightly to front excluding dirt from the air stream.

Here's the WEIR "U" Series, assembled except for casing. Installation is quick, simple and easy—saves time. Giant radiator extracts more heat.

THE MEYER FURNACE COMPANY

Offices: Peoria, Ill. • Factories: Peoria and Peru, Ill. • Mfrs. of Weir and Meyer Furnaces; Air Conditioners for Oil, Gas, Coal

AMERICAN ARTISAN, November, 1947

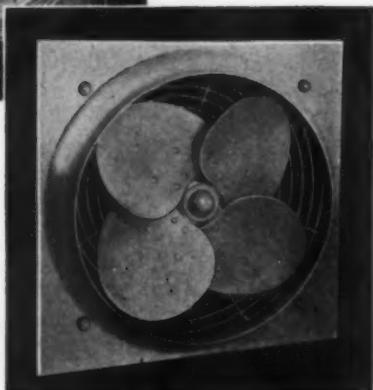
Fresh-Air-Maker direct driven Exhaust Fans

★ ★ ★ Three fine models—12", 16", 20" have been added to the famous Fresh-Air-Maker line

and are ready for immediate delivery.



•12"
•16"
•20"



All 3-SPEED fans—fine performers with high air delivery and surprisingly quiet operation. They are attractive in design and beautifully finished all over in ivory. Complete with cord and plug and convenient 3-speed pull switch so fan can be located high up and speed controlled if desired. Wire guards and manually operated louvers optional.

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New Literature

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Ventilating Division

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- BLOWERS
- VENTILATORS
- BLOWER WHEELS

The Editor's NOTE BOOK

Price Boom

Says George L. Meyer Jr., vice president of Stewart-Warner Corporation, at a conference of the National Association of Purchasing Agents in Milwaukee: "We are in more of a price boom than a production boom."

"While weekly earnings of non-agricultural wage earners were up approximately 67 per cent at the war's peak, and have increased since to almost 94 per cent at the end of the third quarter of this year from the middle of 1939, real wages reached a high of approximately 31 per cent at the war's end and have since declined to approximately 20 per cent as compared to what they were in the middle of 1939. This compares with an increase in the overall cost of living of approximately 58 per cent during the same period. The continuing increase in the cost of food, especially, and the consequent demand for increased wages again exerts an upward pressure on prices. Without question, continued rising prices and rising wages without increased production are not good in the long run—nevertheless, they are here now."

Referring to the reasons for our lack of production, Meyer said:

"Labor supply is still generally tight, it is still difficult to get the kind of labor one wants. There are too many job opportunities, creating a desire to change employment as well as creating absenteeism. Jobs are still easy to get. People don't have to stay on a job long enough to learn it. All of these things are factors in keeping production down. Until people are willing to stay on the job and learn that job as they should, thereby increasing production, our costs of production will be higher than they should be. I know a number of industries, including some of the divisions of our own company, in which wage increases granted last spring were pretty generally absorbed and not passed along to the consumer. That is fine as long as the volume of business is good. Every man who knows anything about running a business well appreciates that with reduced volume profits are wiped out very quickly."

"We must not overlook the fact we are in more of a price boom than a production boom."

Right Now!

Right now is the time to replace dirty dust filters to increase operating efficiency—to save fuel—to ease the load on our transportation facilities.

WHY?

WHY are some appliances easier to sell? The answer's easy when you're selling Rheem! Advanced styling and design give Rheem Appliances "customer appeal". Customers like their smart, streamlined appearance—the quiet, automatic operation—the space and fuel-saving features. It all adds up to greater comfort and convenience.

And because the Rheem line is complete, one appliance helps to sell another. A customer who is satisfied with a Rheem water heater is more likely to buy a Rheem brand of furnace.

As a distributor you'll find it easier to work with a manufacturer who has a complete line—you have one source of supply to contact, and better service on your orders.

Rheem Appliances are ready for immediate delivery. 8 giant plants are producing warm air furnaces, console and wall heaters, water heaters and softeners, evaporative coolers, auxiliary equip-

ment such as automatic stokers, blowers and fans.

You'll find the complete Rheem line more profitable to sell, because you can efficiently buy mixed carload lots of merchandise.

Dealers will find Rheem easier to sell because the Dealer Floor-Finance Plan permits you to stock a full line for only a 10% cash down payment.

Aggressive national advertising, too, makes Rheem Appliances easier to sell . . . advertising that's backed up with a complete set of merchandising aids!

Yes—you'll find that Rheem Appliances are easier—and more profitable—to sell. Mail this coupon today and a Rheem representative will talk it over with you.



RHEEM
Dept. R-E6

570 Lexington Avenue, New York 22, N. Y.

Please have a Rheem man call on me.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

Rheem 
MANUFACTURING COMPANY

All Gas Appliances are approved by the American Gas Association. All Electric Appliances are approved by Underwriters' Laboratories, Inc.





ROYAL JET-FLOW

**Out-performs heating units
costing three times as much**

Jet-Flow is new... different... easy to sell... easy to install. A real profit maker... summer or winter. Royal Jet-Flow gives advantages of forced air circulation, plus ceiling radiation—truly two-way heating. Cost no more installed than conventional wall heaters or floor furnaces. Ideal for tract work.

SEND COUPON TODAY

ROYAL HEATERS INC., 1024 Westminster Ave., Alhambra Calif.

Please, send me, without obligation. Results of comparative heating tests; specifications and prices of Royal Jet-Flow.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

AA1147

The Editor's NOTE BOOK

From Tin Cups To Air Conditioning

Enclosed find check in the amount of one dollar and fifty cents in payment for one copy of the book "Correct Practice in Industrial Sheet Metal Work." I have all my copies of the AMERICAN ARTISAN for the past fifteen or sixteen years, but it is quite a job to get them down and go through them for some specific item on blow piping. I know this book will save me a lot of trouble in hunting what I am looking for.

I am now rounding out fifty years at the trade. I started out when twelve years old in my father's shop and could make quite a lot of tinware at that time. As we kids would hang around a shop in those times, we tried our hands at making tin cups, cookie cutters, and other small items.

The trade has come a long way since those days and men today would be as lost in an old shop as the old timer would be in an up-to-date shop. I'll wager that the old timer would give a better account of himself in a modern shop than the present men would in an old time shop where all tin ware was made by hand. Those old timers were Artists, in every sense of the word. Am sorry to say I have lost much of the touch of that old time work ability, not having made any tinware or anything like it for years.

Well I have reminisced far too much by this time, so send along the book, and I shall enjoy looking it over as much as I enjoy reading the AMERICAN ARTISAN every month.

MILTON L. KISTLER.

Kistler's Sheet Metal Works
Mobile, Alabama.

Foreign Aid

For the aid already extended and to be extended to the people and governments of other nations, the taxpayers of the United States have been forced to assume an unprecedented burden—sums amounting annually to more than our federal expenditures for the years 1922-1933, before our government embarked upon its spending orgy for economic pump-priming, arming, war, and post-war enterprises.—WALTER E. SPAHR, *The Tax Review*.

Right Now!

Right now is the time to adjust and check all heating controls for correct operation—to save fuel—to ease the load on our transportation facilities.

Work Sheet For Sheet Metal Workers

In Stock Reynolds Utility Aluminum



All of the sheets you want for work
in the sheet sizes you want to work
with the machinery you now have at work



Here, too, Aluminum corrugated sheets in stock.

In a phrase, Reynolds Utility Aluminum meets galvanized steel on a competitive level—including price. You can have all you want—now. For full information, without obligation, phone Republic 9100, or write,

BENJAMIN WOLFF AND COMPANY

General Office and Warehouse — 5800 South Seeley Ave., Chicago 36, Ill.

Wisconsin Office — 176 W. Wisconsin Ave., Milwaukee 3, Wis.

Complete New BENCH GRINDER Line Does BETTER, FASTER Work



... in Tool Sharpening, Grinding, Wire Brushing

Now, Black & Decker gives you everything you want in modern bench grinding equipment . . . *all in one complete line!* There are three streamlined Bench Grinders to help you keep a keen cutting edge on all your tools—grind pipe, rings, connections, fixtures, etc.—wire-brush, buff, burnish, polish and finish sheet metal—remove weld marks and burrs. And our new accessories, like illuminated eye shields, grinder pedestals and back-stand idlers, make them even more efficient.

These Bench Grinders are packed with new, postwar features to do a faster job at lower cost. Ask your nearby Black & Decker Distributor for details today . . . and for information on other Portable Electric Tools for heating, piping and air conditioning work. Write for free catalog to: The Black & Decker Mfg. Co., 682 Pennsylvania Ave., Towson 4, Maryland.

LEADING DISTRIBUTORS  EVERYWHERE SELL

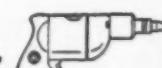
Black & Decker
PORTABLE ELECTRIC TOOLS



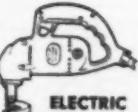
ELECTRIC DRILLS



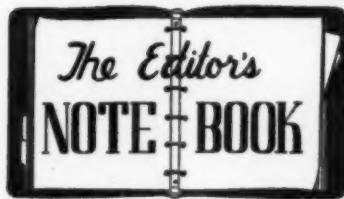
ELECTRIC SANDERS



ELECTRIC SCREW DRIVERS



ELECTRIC SHEARS



Oil Burner Service Manual

We would like to know if there is anywhere obtainable a service and installation manual on the various types of oil burners and their different methods of installation. We are in need of information about the location of tanks, connections to the burner, fill and vent lines, etc.

Also, we are interested in finding servicing instructions for the various kinds of controls for both gas and oil fired installations.

We intend to use this information in compiling a manual for our servicemen.

Thank you for whatever assistance you can give us.

H. HOWARD CURRY.

Maplewood, Missouri.

We have been publishing a series of articles titled "Correct Practice in Oil Heating" which describe all phases of oil burner installation. The series started in July 1946 and will be concluded either this year or early in 1948. If you do not have all the installments on hand, we can probably furnish tear sheets of those which are missing. We suggest this, rather than send you a complete set of tear sheets, because the paper shortage does not permit us to greatly over-print our circulation. We will try to complete the series from our cut copies.

After this oil burner series is published, we will reprint the articles in booklet form which will be available from our circulation department.

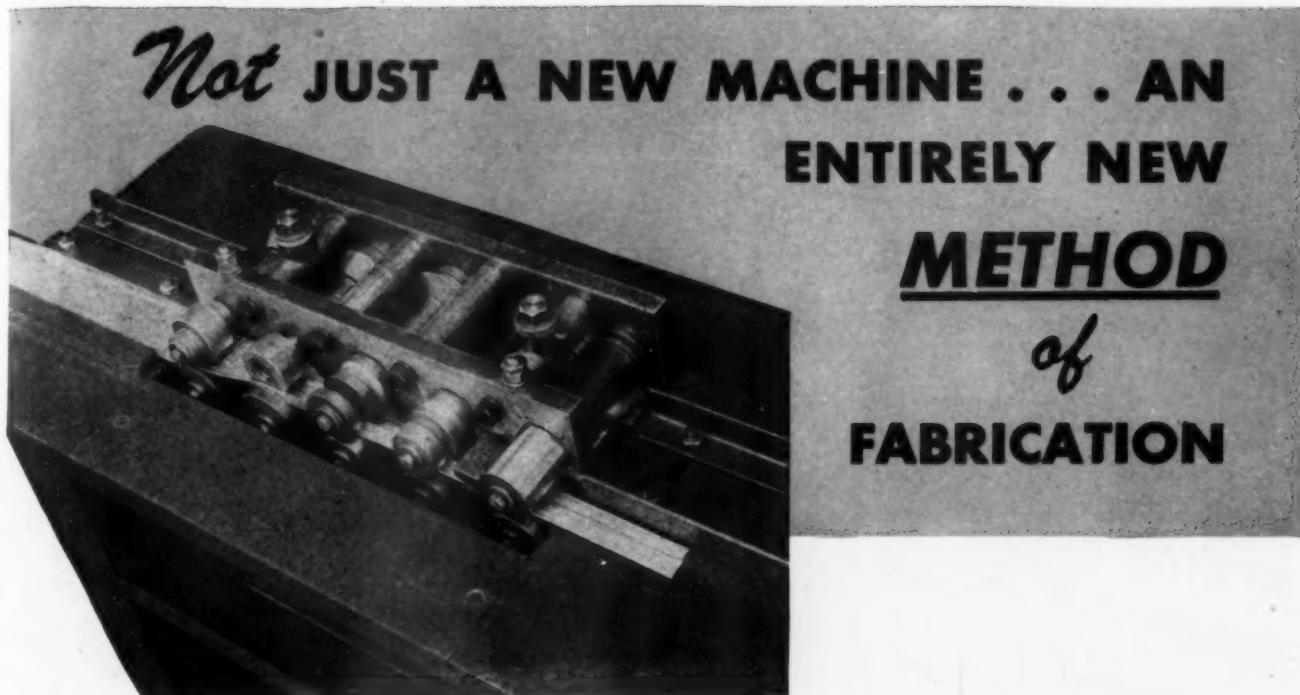
We are attaching a list of oil burner and control manufacturers, each of whom have installation and service instructions for their products. If you will write them they will furnish you with detailed information about their products.—ED.

That Popcorn Bag CRACKLE!

Those who loathe crackling popcorn bags in movies will welcome the new noiseless popcorn bag. Made of specially processed laminated cellophane, the lamination cuts out the c-r-a-c-k-l-e which lasts so long—just when you don't want it to. Another suggestion: Crunchless celery.

Right Now!

Right now is the time to remind your customers who forgot to have their furnaces cleaned—to save fuel—to ease the load on our transportation facilities.



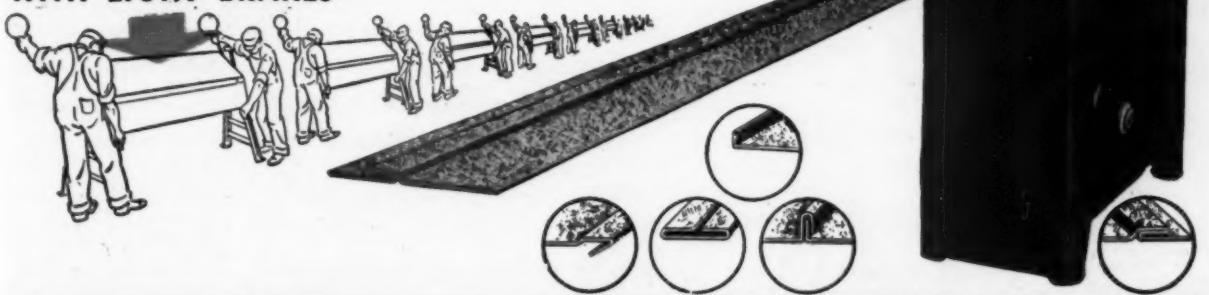
Not JUST A NEW MACHINE . . . AN
ENTIRELY NEW
METHOD
of
FABRICATION

From the day they were first demonstrated, Lockformers have shattered all previous ideas or "standards" of duct fabrication. Formerly, two experienced men could make a Pittsburgh Lock, for instance, in four or five minutes; a Lockformer does it in fifteen or twenty seconds!

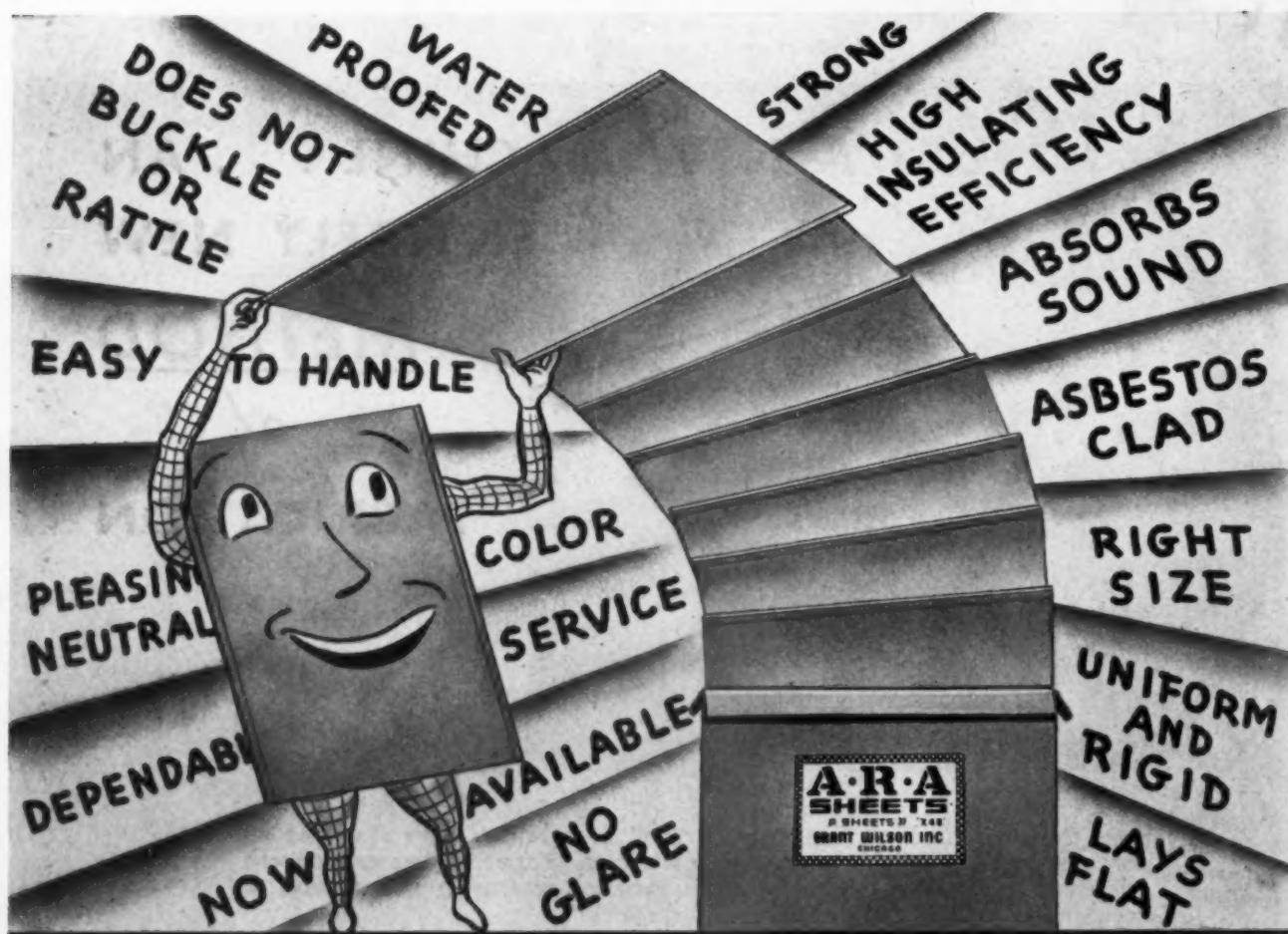
Now, ten years after our first models, Lockformers are almost as common as tin snips. And we're still not able to make them quite fast enough to keep up with the demand.

So—if your shop is a new one, or if you're getting along with one Lockformer when you really need two—please place your order as far in advance of actual requirement as possible. (We're hurrying as fast as we can.)

ONE MAN WITH A LOCKFORMER CAN MAKE MORE
PITTSBURGH LOCKS THAN SIXTEEN MEN
WITH EIGHT BRAKES



THE LOCKFORMER CO.
4615 ARTHINGTON STREET • CHICAGO 44, ILLINOIS



Best by TEST! for Cold Air Returns & Fabricated Ducts

During this extended sheet metal shortage A.R.A. Sheets rate FIRST CHOICE because of the many favorable characteristics of this one man sheet. Even sheet metal ducts, while preferred, would have to be insulated to equal the high insulating efficiency and sound deadening qualities of this nationally famous sheet. Its strength and solidity makes it a substantially BETTER duct than one made of lighter metals as a substitute.

Used for COLD AIR RETURNS, these uniform and

rigid Sheets are unexcelled as they are just the right size to cover the joist spaces perfectly. They absorb noise, repel moisture and insulate all at the same time (K. .45 B.T.U.). Furthermore they won't rust or look gaudy on the ceiling.

Buy A.R.A. Sheets today, they're available and will continue to be until regular sheet metal comes back to do the job—in the meantime rely on the tried and proven A.R.A. Sheets—millions of square feet are in use and have been in use for years.

CARTON CONTENTS
20 sheets 33" x 48" Per Carton

SHIPPING WEIGHT
Approximately 100 lbs. Per Carton

SHEET THICKNESS
Approximately 3/16" thick

GET GENUINE A.R.A. SHEETS FROM YOUR JOBBER

GRANT WILSON, INC.
141 WEST JACKSON BLVD. AT LA SALLE ST. CHICAGO 4, ILL.
22nd Floor, Board of Trade Bldg. Phone: Wabash 8220

WRITE TODAY FOR THE FREE 16-PAGE
ILLUSTRATED BOOKLET NO. 8911-A

Since Jan. 1st
1947

CENTURY DEALERS HAVE DOUBLED IN NUMBER

Century "Protected" Area Franchises . . .

have played a large part in Century's expansion, because Century dealers know that sales are carefully restricted to authorized outlets.

AVAILABLE NOW . . .

are a number of attractive Century Franchises. Your inquiries will be appreciated.

WRITE TODAY . . . for complete details of Century's dealer plan.



**A quality product . . . a profit-tested promotion program . . .
Two of the many reasons why Century is preferred.
by alert dealers everywhere!**

Every day...in more places...more dealers are introducing Century Oil Burning Equipment. Trouble-free operation . . . lower maintenance costs . . . and fewer servicing headaches are quickly recognized by progressive dealers as profit-producing advantages of their Century "Protected Area Franchises."

National consumer advertising . . . complete mat service . . . cooperative advertising agreements . . . truck and window signs, as well as attractive sales literature help round out

Century's well-coordinated plan to pave the way in a market that becomes more competitive, month by month. Your territory may be open. Century invites your inquiry, and the opportunity to present their complete plan of protected, profitable franchises.

CENTURY
Engineering Corporation
CEDAR RAPIDS, IOWA

OIL BURNERS
HUMIDIFIERS

BOILER-BURNER UNITS
WATER HEATERS

WARM AIR FURNACES
AIR CONDITIONING

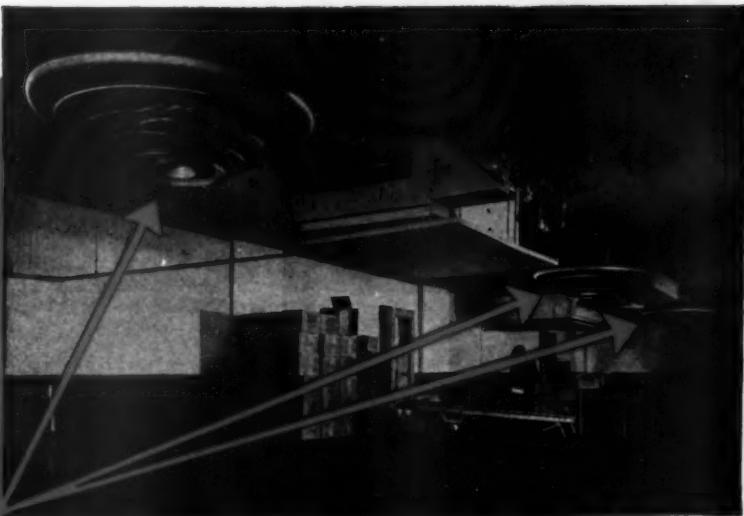
EMPLOYEES COULDN'T
WORK HERE UNTIL
CONTRACTORS

eliminated drafts
WITH

ANEMOSTAT AIR-DIFFUSERS!

You're looking at the shipping room of the Bowman Dairy plant at River Forest, Illinois. Originally it was equipped with two ceiling-type unit coolers with the usual horizontal grilles . . .

Blasts of air from these unit coolers were then so severe that employees could not endure room temperatures of 50° F.



Hoping that scientific air-diffusion was the answer to employees' complaints, one of their horizontal grilles was replaced with a *draftless* ANEMOSTAT air-diffuser. *That was the solution!* And the owners quickly ordered two more ANEMOSTATS. Today, working conditions are reported as "not only satisfactory, but enjoyable."

HOW ANEMOSTATS COMPLETE AIR-CONDITIONING

Due to its patented design, the ANEMOSTAT distributes air of any duct velocity in a multiplicity of planes traveling in all directions. Simultaneously, the unit creates a series of counter-currents which siphon into the device room-air equal to about 35% of the volume of the supply-air. This room-air is mixed with the supply-air within the diffuser before the air-mixture is discharged into the room. The velocity of the discharged air is instantly reduced within the ANEMOSTAT by air expansion.

In this way, the ANEMOSTAT diffuses air of any duct velocity noiselessly and evenly, thoroughly and draftlessly throughout the room . . . closely equalizes temperature and humidity . . . and prevents air stratification.

HOW ANEMOSTATS HELP THE CONTRACTOR

ANEMOSTAT wall or ceiling diffusers permit the use of higher velocities and greater temperature differentials. As a result, you gain corresponding reductions in duct sizes and number of duct outlets. Substantial savings in installation and operating costs naturally follow. And contractors particularly appreciate these ANEMOSTAT features—they have no moving parts . . . never need attention or replacement . . . never cause call-backs.

THERE IS NO SUBSTITUTE FOR ANEMOSTATS

Remember, that substitution of grilles, registers, or cheaper air-diffusers for ANEMOSTATS endangers the success of the whole air-conditioning installation. ANEMOSTATS assure a successful installation at a cost of less than 5% of the total air-conditioning investment. Be prepared to save money and trouble on your next air-conditioning job — write for your ANEMOSTAT Bulletin today.

AC-1044A

ANEMOSTAT
REG. U. S. PAT. OFF.
DRAFTLESS AIR-DIFFUSERS

ANEMOSTAT CORPORATION OF AMERICA,
10 EAST 39TH STREET, NEW YORK 16, N. Y.
REPRESENTATIVES IN PRINCIPAL CITIES

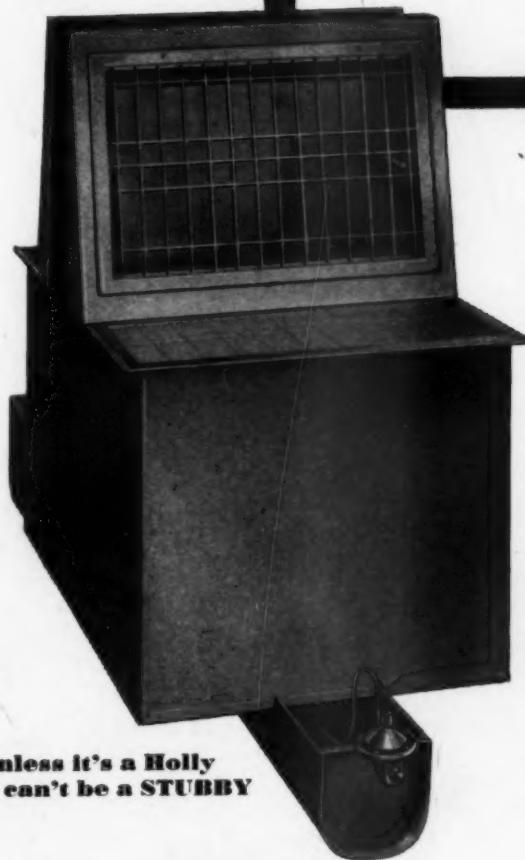
NO AIR CONDITIONING SYSTEM IS
BETTER THAN US AIR DISTRIBUTION

it's 1-2-3

WHEN YOU INSTALL THIS REVOLUTIONARY

HOLLY

Stubby



Unless it's a Holly
it can't be a STUBBY

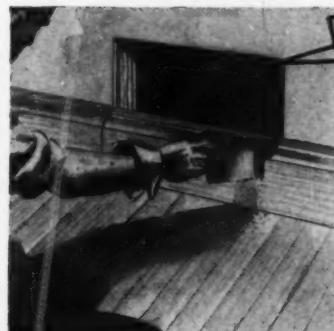
In addition to the STUBBY'S outstanding ease of installation, it offers the further advantages of freedom from operational worries and breakdowns, economy and long life.

Holly STUBBY Furnaces are available now in flat and dual types from 30,000 to 57,000 BTU input. They are sold only by licensed installing dealers. Qualified dealers are invited to write for details.



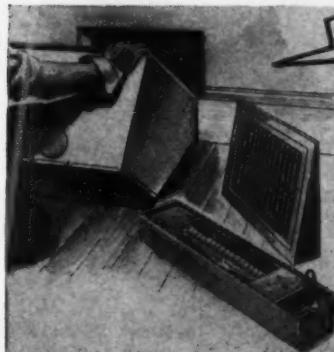
HOLLY MANUFACTURING CO.
847 SOUTH ARROYO PARKWAY, PASADENA 2, CALIFORNIA

Holly's Engineered Improvements Have *Cut Installation Time* Which Means Bigger Profits For You!
Here's Why:



1.

You cut a hole to exact size of the furnace. Do *not* over-size it!



2.

Slip the STUBBY through this hole from above the floor and nail to the floor joists; the finish floor is laid up to the furnace casing.



3.

The separate patented burner pan, containing all working parts, now is quickly attached to the bottom of the furnace with just 2 wing nuts. No tools required. Then connect vent and gas line to complete job.

**"AS
ADVERTISED"**
in Better Homes and Gardens
and House Beautiful

Why we are not "forgetting" present users of gas heat

OVER the years, we have found that much of our best selling is often done by present users of gas heat and Janitrol equipment.

There are plenty of reasons why these boosters are also important to you, our dealers.

For their experience with the use of Janitrol gas heat is told and retold . . . to friends and neighbors . . . this influence affects the whole community.

We believe that many of these present gas heat users would benefit by installing newer, more modern systems.

Improving customer comfort helps you keep a

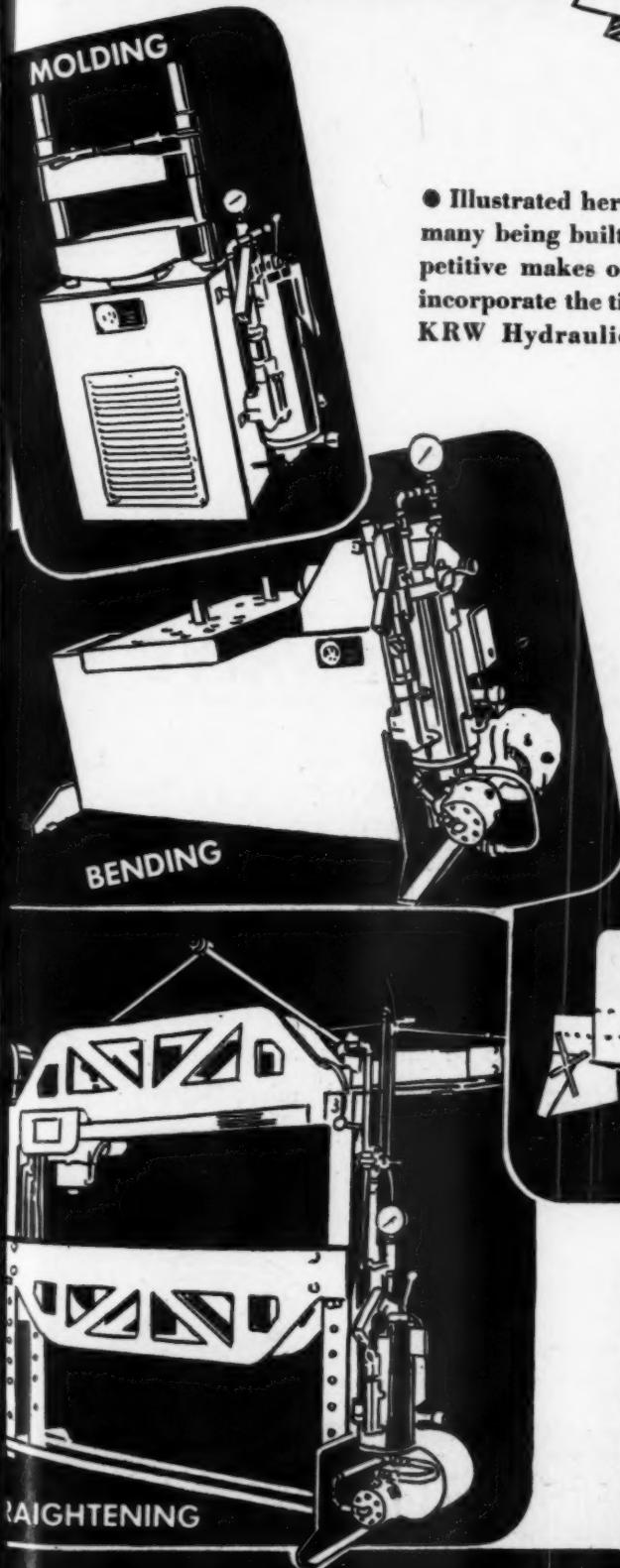
booster . . . helps to keep gas business coming your way . . . all of which becomes tremendously important in areas where conversion to gas heating is restricted.

So, while we are still selling gas heat and interesting new prospects in Janitrol equipment, we believe we should also remember old gas customers. The current advertisements shown above are part of a continuing campaign directing prospects to Janitrol dealers.

We have prepared a local tie-in plan to "up-grade" present gas users to new equipment. If you haven't seen it in detail, write us today. It can mean new business and new profits for you.

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

Name the JOB!



There's a **KRW PRESS**
that can do it
BETTER...for LESS

Illustrated here are four KRW Hydraulic Press adaptations that are typical of many being built by KRW today. All are priced from 30 to 200% less than competitive makes of comparable tonnages or capacities. All are motor-driven and incorporate the time and production proven features that have made the standard KRW Hydraulic Arbor Presses...the most widely used press of their type in America. Take the KRW Sliding Head Straightening Press as an example. This type KRW Press has been effecting tremendous labor savings in fabricating plants where plate must be "trued up" before it is processed or fabricated. The heavy, hand method formerly used was archaic and very costly by comparison. The same story holds true of KRW Stretcher-Levellers, KRW Blanketing and Forming Presses, KRW Compression Molding Presses, KRW Bending Presses and many others. To save your time and ours, tell us your problem in terms of what you want to accomplish. We'll give you an answer and furnish literature that is pertinent to your needs. Mail the coupon now.

Write for the
NEW
KRW
Catalog.....



56

K. R. Wilson, 215 Main Street, Buffalo 3, N. Y.

Please send your catalog. We are particularly interested in your
 Bending Presses Compression Molding Press
 Straightening Press Stretcher-Leveller Forming and
 Blanking Press

Firm Name

Address

City and Zone..... State.....

K·R·WILSON

215 MAIN ST. - BUFFALO 3, N. Y.

The **BIG** difference in AIR CONDITIONING REGISTERS



is the **H&C** TURNING BLADE VALVE



Of all the popularly priced air conditioning registers, only the H&C No. 75 line can offer the incomparable TURNING BLADE VALVE . . . the one valve that uniformly distributes the airflow over the ENTIRE face . . . that reduces turbulence and resistance, according to impartial authorities, as much as 30% . . . that assures better distribution to the farthest parts of the room.

There's a world of customer satisfaction to be gained by using this outstanding register, and it costs no more than conventional multi-deflection registers. Complete details and engineering data are contained in our new catalog No. 48. See your jobber or write directly to us if you do not have a copy.



HART & COOLEY MANUFACTURING CO., HOLLAND, MICH.
World's largest Manufacturers of Registers, Grilles and Furnace Accessories

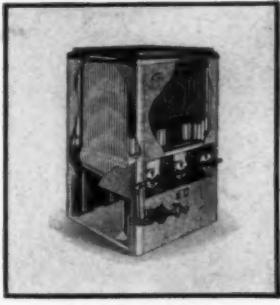
New RYBOLT Units IN STEEL AND CAST IRON



Rybolt Series 15
Cast Iron Coal Fired
Gravity Furnace



Rybolt Series RH 71
Steel Coal-Fired
Gravity Furnace



Rybolt Series RG 53
Cast Gas-Fired
Gravity Furnace



Rybolt Series RG 54
Cast Gas-Fired
Winter Air Conditioner

These RYBOLT heating units in steel and cast iron, fired by coal and gas, represent a line that will give the dealer a big advantage in securing his share of the heating business.

With one exception these units are completely new with advanced features that are sound and practical yet register a soaring high in modern heating engineering development—compact, efficient, dependable and economical.

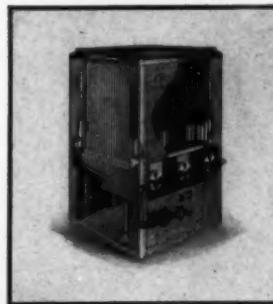
Series 15 RYBOLT cast iron, coal fired furnace retains the fundamental features that has made this standby famous. Yet to this model also have been added important new improvements and refinements that make it a decidedly better and more saleable furnace to meet the requirements of a more competitive market.

The dealer with the RYBOLT line today can talk quality with a new emphasis. He has what it takes to meet the requirements of the consumer who has been educated to expect more value in home heating equipment.

There's a big market ahead for dependable home heating units. Send in your order now to make sure of having ample stock on hand.



Rybolt Series RG 52
Steel Gas-Fired
Winter Air Conditioner



Rybolt Series RG 51
Steel Gas-Fired
Gravity Furnace



Rybolt Series 152
Cast Coal-Fired
Winter Air Conditioner



Rybolt Series RH 76
Steel Coal-Fired
Winter Air Conditioner



THE RYBOLT HEATER COMPANY
615 MILLER STREET

ASHLAND, OHIO

"*at Home*" ON ANY HOME



BERGER STYLE "K" Simplified Type Box Gutter

... blends with every type of architecture. It never appears out of place—always looks *right*.

Style "K" ends obsolescence problems, too. Adopted as the standard type gutter, it is universally made by various manufacturers; lengths always are interchangeable.

It is only one item in the complete Berger Line of Drainage Products that have proved unexcelled for long life and trouble-free service under all weathering conditions. Berger Drainage Products—made from galvanized open-hearth and copper-bearing steel, rust-resisting Toncan Iron and copper—resist rust and the abuses of fabrication and wear. They always are uniform in size and shape . . . make installation fast and easy.

See your local distributor about Berger Style "K" Simplified Type Box Gutter—also Conductor Pipe and Accessories, SNAPTITE Eaves Trough, Roofing of all types and Metal Lath.

BERGER MANUFACTURING DIVISION
REPUBLIC STEEL CORPORATION
CANTON 5, OHIO

Warehouses in Boston, Philadelphia and St. Louis



Norge Heat Furnaces Alone Burn Fuel Oil In A WHIRLWIND OF FLAME

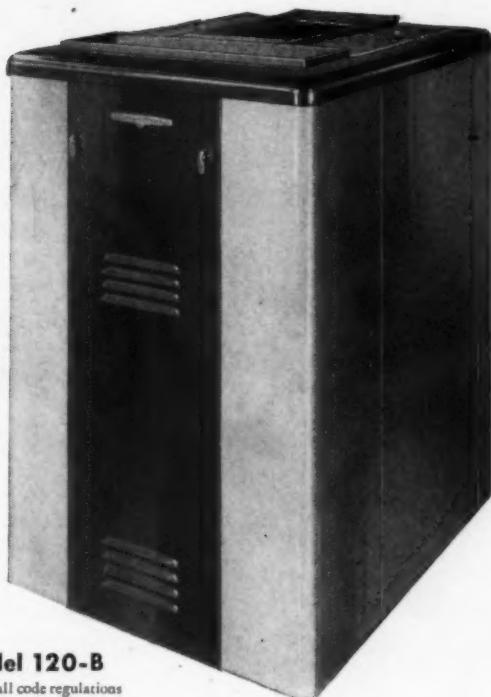
**REVOLUTIONARY NORGE HEAT DESIGN
GIVES HOME OWNERS MORE HEAT AT
LESS COST . . . MORE COMFORT . . .
MORE SATISFACTION**

The Norge Heat winter air conditioner is different in design, superior in performance, unequaled in results.

There's no finer winter air conditioner in the world.

Fuel and air are mixed with "Whirlator" precision—and burn with maximum efficiency in a whirling, induced, Vacuum-Draft flame. So complete is combustion that no soot, smoke or unburned particles remain. Owners report savings up to 40% in fuel and operating costs.

What's more, Norge Heat's *Whirlwind of Flame* design means *steadier, more uniform heat*. There's no heavy refractory mass to heat up before heat can be delivered through the home, no heavy mass to cool after the thermostat is satisfied—because Norge Heat uses a combustion chamber of new, high-temperature alloys. Conditioned warm air is delivered to the home *within 40 seconds* after the thermostat calls for heat . . . is cut off *immediately* when the thermostat setting is reached.



Model 120-B

Meets all code regulations

You can sell more customers . . . make more profits . . . with these *proved* advantages of Norge Heat winter air conditioners. Norge-Heat's revolutionary *Whirlwind of Flame* is the "hottest" development in the heating field . . . for sales, for satisfaction.

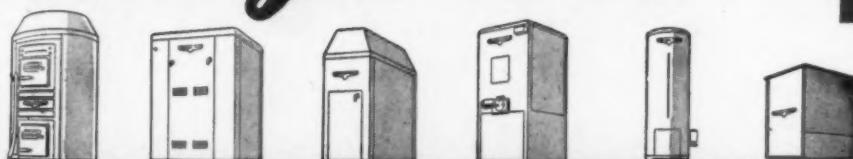
Norge Heat Division, Borg-Warner Corporation • 672 East Woodbridge St., Detroit 26, Michigan



Products of
BORG-WARNER

Norge Heat

"LIVING'S A TREAT
WITH NORGE HEAT"



TONCAN IRON

Stays on the Job Longer



Long, trouble-free life is a natural characteristic of every sheet metal part made of Toncan Iron. And not without good reason, too.

Toncan Iron contains extra copper—twice as much as copper-bearing steel or iron—plus molybdenum, to bring out the full effectiveness of the copper. Thus, *Toncan Iron develops the highest rust-resistance of all ferrous materials in its price class*—lasts years longer than less resistant materials.

Add the fact that this rust-resistance is not just a surface quality, but extends uniformly throughout the metal—is unaffected by bending, shearing, punching, corrugating, riveting and other cold working—and it's easy to understand why cost-wise sheet metal men, for nearly 40 years, have made it a point always to specify Toncan Iron. Important, too, Toncan Iron welds readily.

Like more information? Write to:

Long life is but one of the many advantages of Toncan Iron which can help you build your business and profits. For the complete story about its money-making possibilities, write for Booklet No. 410, "How Toncan Iron Makes Money for Sheet Metal Contractors and Fabricators."

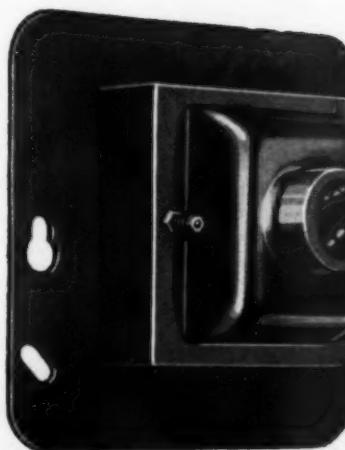
REPUBLIC STEEL CORPORATION
GENERAL OFFICES CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York



Republic
**TONCAN COPPER
MOLYBDENUM IRON**

—for ducts, gutters, conductor pipes, roofing, siding, tanks, ventilators, skylights, hoods, and other sheet metal applications requiring rust-resistance

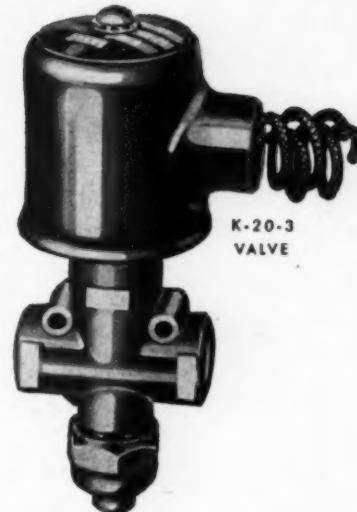
T-23 OIL HEATING PACKAGE SET



T-2 TRANSFORMER



T-770 THERMOSTAT



K-20-3
VALVE

Automatically Yours For Better Temperature Control



WRITE FOR FREE DESCRIPTIVE LITERATURE

THE NEW AGA APPROVED
Palmaire

SUSPENDED UNIT
GAS HEATER
and the

FORCED AIR GAS FURNACE
HAVE EXTRA
DEALER ADVANTAGES

From top to bottom . . . inside and out . . . these new smart-looking heating units have more economy, more heating value, more beauty than ever before!

To you, this means more profitable sales from residential, business or industrial buildings. It means your customers are assured of dependable, care-free service . . . season after season. It means selling costs go down . . . profits go up!

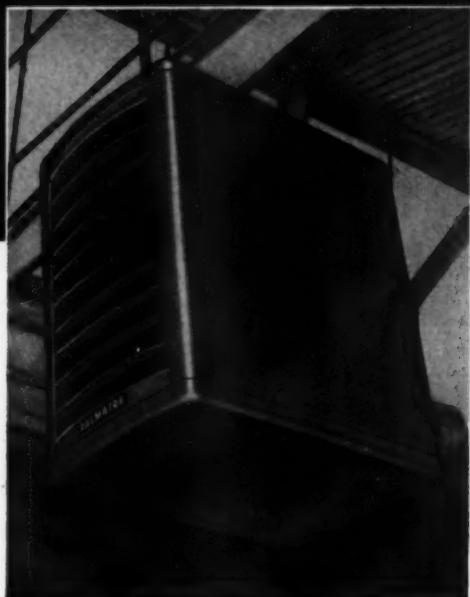
And when you stock Palmaire heating equipment, you're backed by an organization that offers the right kind of dealer-helps.

38 YEARS OF AIR CONDITIONING LEADERSHIP

*Write for free
literature today!
Department AAI*

Palmer

MANUFACTURING CORPORATION *Phoenix, Arizona*

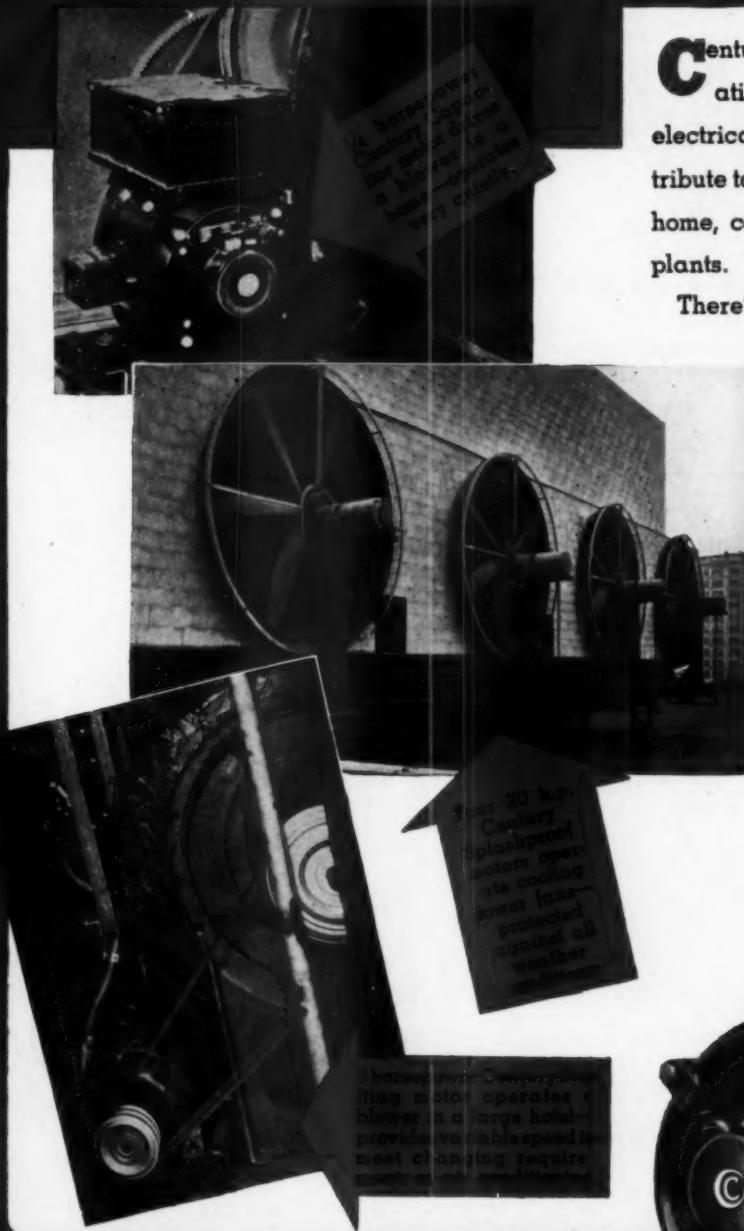


FOR EVERY BLOWER APPLICATION

THERE'S A **CENTURY MOTOR** THAT

WILL OPERATE

SMOOTHLY · QUIETLY · DEPENDABLY

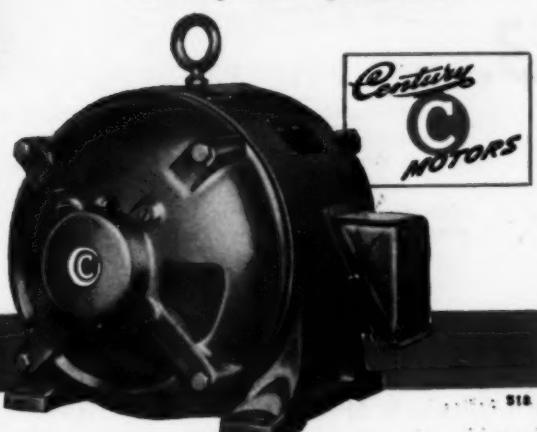


Century motors' quiet starting and operating and their unusual freedom from electrical and mechanical vibration contribute to comfortable air circulating in the home, commercial buildings or industrial plants.

There's a type of Century motor protection to meet the requirements of any kind of atmospheric condition — whether clean or dirty, hot or cold, whether indoors or outdoors.

Century builds a complete line of electric motors and generators, fractional and integral horsepower, in the popular sizes to meet the requirements of industrial production, processing, commercial and home needs.

Specify Century for all your electric power requirements.



1806 Pine Street, St. Louis 3, Missouri
Offices and Stock Points in Principal Cities

3 BIG SELLING JOBS PETRO DOES FOR YOU

Three of your primary sales steps are handled by Petro's national advertising. You concentrate on final selling . . . closing the order. Working directly for you, this advertising —



1. ESTABLISHES CONTACT WITH YOUR PROSPECTS

Appearing in publications of wide homeowner circulation, it contacts desirable oil burner prospects by the millions . . . efficiently . . . often . . . including those in your locality.

2. AROUSES INTEREST IN THE OIL BURNER YOU SELL

Stressing reliability, low cost performance, the maker's reputation . . . it pre-conditions your buyers to the many advantages of Petro oil burners.



3. CREATES A PREFERENCE FOR YOUR SERVICES

Each of these millions of action-impelling Petro sales messages also directs customers to your door . . . customers already more than half sold.

Strengthen your oil burner selling . . . benefit from this powerful promotion. See your nearest Petro wholesaler.



PETRO

REG. U. S. PAT. OFF.

OIL BURNERS • BOILER BURNER UNITS
FURNACE BURNER UNITS • WATER HEATERS

PETROLEUM HEAT AND POWER COMPANY • STAMFORD, CONNECTICUT
Makers of Good Oil Burning Equipment Since 1903

Petro Refineries in: CORPUS CHRISTI AND PORT ISABEL, TEXAS. Fuel Oil Bulk Plants and Distribution Terminals in: BOSTON • PROVIDENCE
STAMFORD • MT. VERNON • NEW YORK • MINEOLA • BROOKLYN • NEWARK • PHILADELPHIA • BALTIMORE • WASHINGTON • CHICAGO

I'm *Doc Tillary*, one of Federated's friendly service men. Me and the other Federated service boys have worked with metals for quite a while now and ... we know our stuff. What's more, we're ready to prove it to you any time you run into a metal problem, big or little.

Federated is a right large outfit—first in the whole non-ferrous field—and they're anxious to have us service men roll up our sleeves and help you out whenever you ask.

Remember, boys, for service ... for anything in the non-ferrous metals line, call Federated first. Our offices are all over the country.

I'll be seeing you and talking to you again pretty soon. So long for now.



Comfort IS Profitable

**"BY 1970 20% OF THE
CENTRALLY HEATED HOMES
WILL HAVE OIL HEAT"**

Robert E. Wilson

CHAIRMAN OF THE BOARD, STANDARD OIL CO.
(IN "FUELOIL & OIL HEAT")

Demand for clean, reliable, economical oil heat continues to grow. Everybody wants it because it provides a maximum of comfort. Mr. Wilson, in his article, bases his forecast on a statistically proved trend.

People want comfort—and furnishing it to them is a most lucrative business. *Comfort is profitable.*

One of the best ways to profit from this desire for comfort in heating is to sell oil fired space heaters, water heaters, ranges, furnaces, etc., equipped with "Detroit" Float Valves.

These valves are dependable and durable—simple and easy to keep clean. Temperature compensation assures uniform fuel flow regardless of fuel temperature. Full heater output is assured at all times.

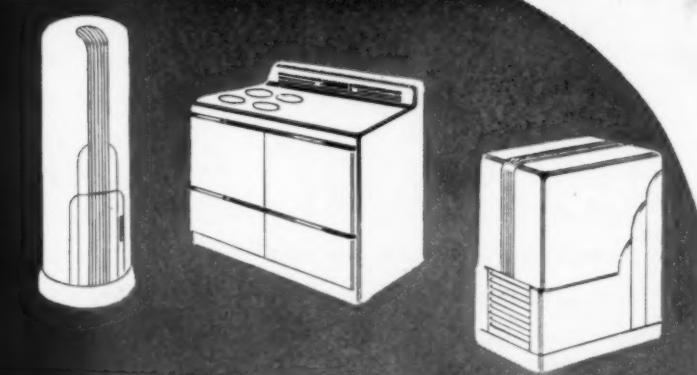
2739

DETROIT LUBRICATOR COMPANY General Offices: 5900 TRUMBULL AVENUE
DETROIT 8, MICHIGAN



Division of **AMERICAN RADIATOR & Standard Sanitary CORPORATION**
Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators



"DETROIT" CRC-246 FLOAT VALVE

The new improved "Detroit" Float Valve. May be leveled by eye—accurate regulation for low fuel flow rates—positive trip mechanism trips from fuel level in burner as well as in valve. Fully temperature compensated.

"Detroit" Float Valves
Guardians of the Home Fires





One stands out above the rest!

Performance plainly hinges on the way things are built.

Ohio Motors feature a special *two-piece* type of construction. End brackets — plus integral mounting flanges and motor frames — are made *exclusively* of gray cast iron for greater strength.

STURDIER CONSTRUCTION of *Ohio Motors* assures superior oil burner performance . . . guarantees customer satisfaction.



THE OHIO ELECTRIC MFG. CO.

5913 MAURICE AVE. • CLEVELAND 4, OHIO

The new Mueller Climatrol Type 209 Winter Air Conditioner is a compact vertical unit with the blower assembly mounted in a ball-bearing Roll-a-Drawer below the heat exchanger. The heat exchanger is streamlined to provide uniform distribution of air, minimum static pressure, and high rate of heat transfer.

NEW

Mueller Climatrol Type 209 Oil-Fired Winter Air Conditioner



**gives your customers unique features
for extra convenience and economy**

You can mark up another "first" for Mueller Climatrol: The Roll-a-Drawer — a service unit (patent applied for) which mounts the entire blower, motor, and drive assembly on ball-bearing rollers, so that it is completely accessible for adjustment and servicing, with a flick of the wrist.

The all-welded heavy steel heat exchanger is thermodynamically designed, has no internal baffles to cause strains or noises, is electric-arc welded throughout, with all passageways easily cleanable from the front access panel.

The Type 209 Mueller Climatrol is available in three sizes, with vaporizing or pressure atomizing oil burner, and is shipped from the factory in

a completely assembled package. Compact in size, it easily goes through any normal closet door. Filters may be installed in the bottom, either side, or the rear of the handsome, green cabinet.

The Type 209 Mueller Climatrol sells itself to your customers and keeps them sold, by delivering the true indoor comfort of "climate control."

It really pays to capitalize on the big competitive advantage the Type 209 gives you. Sell it for new homes or to replace obsolete equipment. Write for complete information on the Type 209 today. *L. J. Mueller Furnace Company, 2010 West Oklahoma Avenue, Milwaukee, Wisconsin.*

MUELLER
Climatrol

REG. U. S. PAT. OFF.

B-77



LEADING THE WAY...

—to better business
and customer service!



THE CAB THAT "BREATHES" . . .
fresh air is drawn in from the outside
—heated in cold weather—and used
air is forced out!*



The cab is **FLEXI-MOUNTED**—cushioned on rubber against road shocks, torsion and vibration! . . . **DRIVER'S COMPARTMENT** is wider, with more leg room. The seats are fully adjustable, bigger and more comfortable. Wider, deeper **WINDSHIELD** and **WINDOWS** increase visibility by 22%!



Panels and pick-ups have **INCREASED LOAD SPACE**—stake and high rack bodies **MORE EFFICIENT LOADING**. . . . New, stronger, sturdier **FRAMES** are designed to carry greater loads greater distances for a longer time!



LONGER WHEELBASES give better load distribution. . . . Chevrolet's famous **FULL-FLOATING HYPOID REAR AXLES** are geared for the load!

Chevrolet **VALVE-IN-HEAD TRUCK ENGINES** are world's most economical for their size. . . . There are **HYDRAULIC TRUCK BRAKES**, exclusively designed for greater brake-lining contact—for positive action!

ADVANCE-DESIGN CHEVROLET TRUCKS

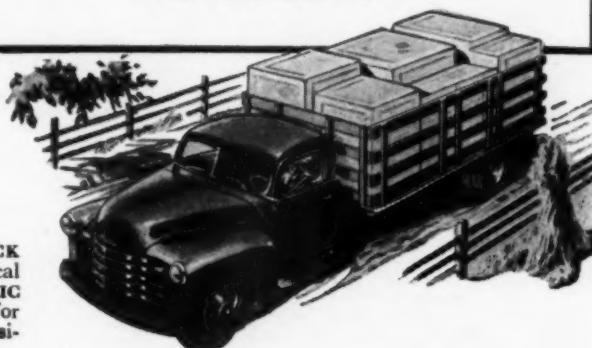
with the cab that "breathes"!

East coast, west coast, and all around the country, Chevrolet Advance-Design trucks are fast delivering improved service to businesses and their customers, through their ability to *stay on the job—save on the job*. They're the talked-about trucks, with the sensational cab that "breathes"—that almost literally "inhales" fresh air and "exhales" used air!—plus a host of new features and innovations that make them a *must* to see!

*Fresh-air heating and ventilating system optional at extra cost.

**CHOOSE CHEVROLET TRUCKS FOR
TRANSPORTATION UNLIMITED!**

CHEVROLET MOTOR DIVISION, *General Motors Corporation*
DETROIT 2, MICHIGAN



★ ★ ★ ★ ★

**NOT ONLY NEW!
NOT ONLY DIFFERENT!**

BUT

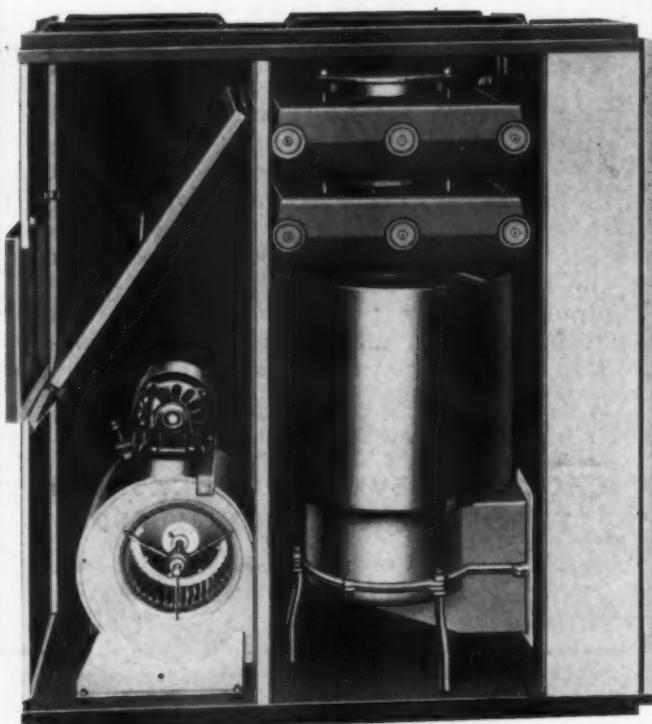
Beyond Comparison

Luxaire's New

CAST IRON

GAS FIRED

AIR CONDITIONING UNITS



Luxaire's ingenious engineering has created this New . . . Different . . . Incomparable . . . cast iron, gas-fired heating unit—the unit that is unsurpassed in innovations that are revolutionary in the design and construction of modern heating equipment.

There's *not one* single vertical joint in the entire heating assembly—the tightest, most leak proof heating element ever produced.

The one-piece cast iron radiator is provided with cleanout ports that are always easy to remove.

Only 6 castings with asbestos rope-packed horizontal cup joints in the entire assembly.

In a half hour or less the entire heating unit can be removed without disturbing the cabinet duct work or dismantling the gas manifold.

The units have passed all high and low temperature limits established by the American Gas Association.

THE C-A-OLSEN MANUFACTURING COMPANY

Luxaire



HEATING & AIR CONDITIONING UNITS



ORDER NO. 1403

FROM ORE TO ORDER

WEIRTON STEELS ARE IN THE HANDS
OF MASTER STEEL WORKERS

At blast furnace, open hearth and mill, the Weirton men who translate base ore into finished steels are masters of their trade. They know steel, think steel, live steel. The skill and experience they apply to each operation are essential ingredients in every ton of Weirton steel.

WEIRTON STEEL CO.

WEIRTON, W. VA. Sales Offices in Principal Cities.

Division of NATIONAL STEEL CORPORATION Executive Offices, Pittsburgh, Pa.



TODAY'S GAME STARTING LINEUP

Position	Player	No.
FB	Pressure Burner Furnace	600
HB	Gas Furnace	500
HB	Coal Furnace	300
QB	Flatpak	00
LE	Consol-Heater	2700
LT	Floor Furnace	891
LG	Conversion Burner	700
C	Year-Round Air Conditioner	030
RG	Water Heaters	900
RT	Boilers	100
RE	Vaporizing Burner Furnace	800

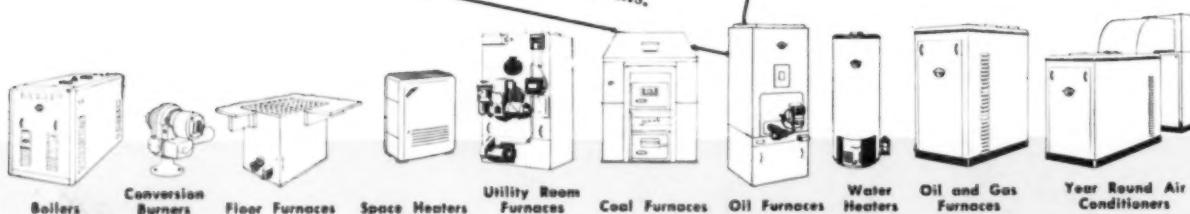
VIKIMATIC ALL-STARS

... a top-notch performer at every position ... all set and ready to go! VIKIMATIC'S line is a **COMPLETE LINE** ... each unit a proven product. COAL, GAS, OIL, or L. P. GAS for fuel ... utility room or basement units ... wet heat or warm air ... water or space heating ... winter or year-round air conditioning ... in all capacities for domestic heating or cooling ... and installed with the amazingly efficient **FLATPAK PREFORMED ALUMINUM DUCTWORK**, the ductwork system that is so easy to ship, to store, to handle, and to assemble.



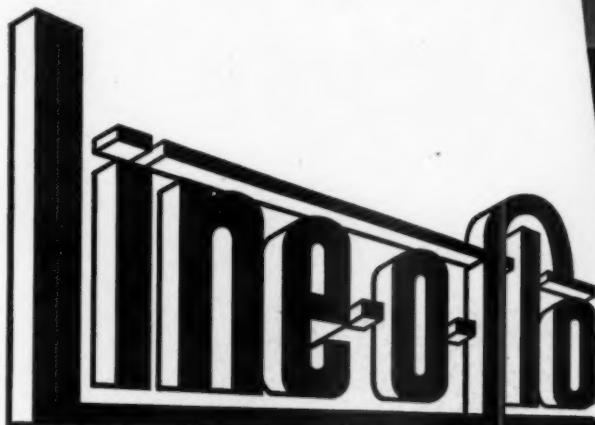
Increased profits are yours for the making with the complete VIKIMATIC LINE ... saleable units in every season throughout the year. Manage this Team of Teams ... see your VIKIMATIC Distributor for details.

THE VIKING MFG. CORP.
1747 Chester Avenue, Cleveland 14, Ohio



BARBER-COLMAN

B.C.



Available for
Prompt Delivery

CEILING OUTLETS

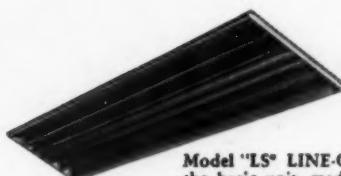
Keyed to Modern Architectural Concepts.....

A Vital Contribution to Continuity of Design.....

**A NEW APPROACH
TO AIR DISTRIBUTION**

LINE-O-FLO air distribution outlets can be used singly, or end-to-end in continuous strips. Units are constructed of scientifically-designed, rolled-steel members, with orifices simulating Venturi throats having carefully-engineered bell mouth approaches.

This outlet has high diffusion efficiency. Room air is rapidly induced into the primary air stream to quickly equalize the temperature differential. Write today for a copy of Bulletin F-2741 giving descriptive and engineering data. Your Barber-Colman representative can show you a sample unit and discuss details.



Model "LS" LINE-O-FLO,
the basic unit, made in 3
styles to accommodate any
installation arrangement



Model "LL" LINE-O-FLO,
designed to receive Model
M21118 DAY-BRITE
lighting unit (made by
Day-Brite Lighting, Inc.,
St. Louis).

BARBER-COLMAN COMPANY

1226 ROCK STREET • ROCKFORD, ILLINOIS

KO-Z-AIRE

Conditioned Heat



THE "150"

Modern in design and highly efficient. Automatically fired by oil or gas—for the average 6-room home.

THE "HI-BOY"

Made especially for small home installations where space is at a premium. Automatically fired by oil or gas.

Attention!

DISTRIBUTORS—DEALERS

Jones & Brown distribute KO-Z-AIRE Conditioning Units on a firm jobber policy basis. KO-Z-AIRE Conditioning Units are marketed only through jobbers and contractor-dealers to the consumer, and KO-Z-AIRE is a name and a product destined to win and hold a generous portion of the market.

KO-Z-AIRE Conditioning Units are available for IMMEDIATE DELIVERY. They are built by an old line manufacturer—to exacting quality specifications—to sell at popular prices. We urge you to PHONE, WIRE or WRITE for complete prices and information while choice territories are open.

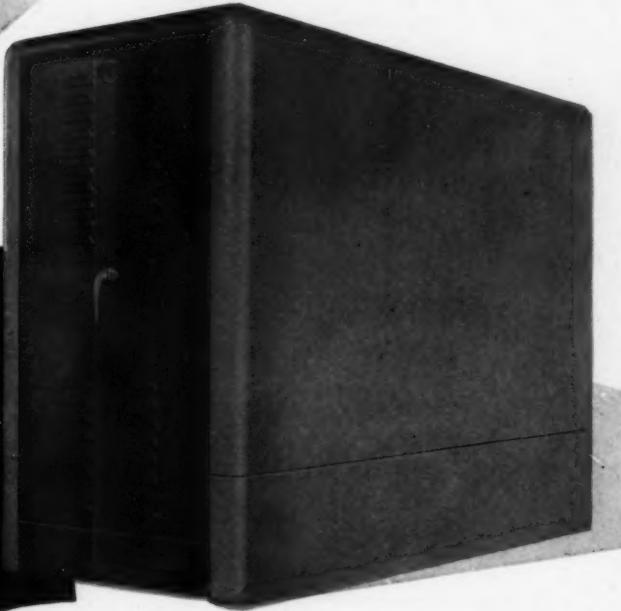


THE "65"

Compactly designed for smaller homes, and "tops" in heating performance. Automatically fired by oil or gas.

THE "220"

For larger homes where plenty of heat is needed quickly for comfort living. Automatically fired by oil or gas.



KO-Z-AIRE

Nationally Distributed by

JONES & BROWN, INC.
436 SIXTH AVE., PITTSBURGH 19, PA.



The Brand most in demand...

DOING without—and occasionally having to resort to unbranded sheets of uncertain quality—has made many sheet metal workers long for the “good old days” when they could get all the quality sheets they needed merely by calling their supplier.

We're doing our best to hasten the return of those days, but the pent-up demand is still so great that it is impossible for our mills to fill all orders immediately notwithstanding that shipments are going out as fast as it is humanly and mechanically

possible to produce the steel.

And because shipments are stencilled with the familiar U·S·S trade-mark—the industry's best-known symbol of quality — users of U·S·S Steel Sheets can be sure that as U·S·S Sheets become available they will be obtainable only through legitimate suppliers . . . and always at a fair price.

So keep in touch with your supplier. You will soon find that for quality, workability and wearability, U·S·S Sheets are second to none.

U·S·S STEEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago

COLUMBIA STEEL COMPANY, San Francisco

TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham

United States Steel Supply Company, Chicago, *Warehouse Distributors*

United States Steel Export Company, New York

7-1248



UNITED STATES STEEL

FIRST

TRULY POST-WAR OIL BURNER

Here is the new MASTER KRAFT oil burner—a **NEW KIND** of oil burner—the greatest advance since oil burners were first invented. Gives the cleanest, hottest oil fire you've ever seen.

FIRST with the Electronic Control . . . "the eye that never closes" . . . watches the fire every moment it burns—gives instant safety control—a great scientific advance. The manufacturer of this burner—Harvey-Whipple, Inc.—is the FIRST major oil burner maker to adopt the Minneapolis-Honeywell Electronic Safety control as standard equipment.

FIRST with a new idea in construction to assure the home owner of quick, easy, low cost service over many years. Amazing new engineering features designed into the MASTER KRAFT oil burner permit complete replacement of any vital component in two minutes! (Patents Pending.)

FIRST with the remarkable DUAL-OXENIZER (Patents Pending). Combines DOUBLE CHARGE OF OXYGEN with the oil, makes possible cleanest, most economical, most effective oil flame ever developed. Tests PROVE this device will easily and efficiently burn the catalytic oils of the future, as easily as it handles the oil of today—an important point to watch when you invest in an oil burner.

**Master
Kraft**

OIL
HEAT

Are you offering your public something *truly* new . . . does your product "talk the customer's language" in dollars and cents . . . in oil saved?

Get the complete facts and figures on the amazing performance of this new burner . . . mail the coupon at right . . . TODAY.

HARVEY-WHIPPLE, INC.
EST. 1922
Springfield, Mass.



The New
Electronic Safety
Control



Units swing open
like doors.



The New
Dual-Oxenizer
(Patents Pending)

Harvey-Whipple, Inc.
Dept. AA-11
Springfield, Mass.
Gentlemen:
Please send me details about a Master
Kraft franchise.

Name	.....
Address	.....
City	.....
State	.....



only by manufacturers
of nationally advertised
fan system apparatus.
List on request.

HIGH
SPEED
HIGH
EFFICIENCY
IN HEATING
OR COOLING...

AEROFIN

For exceptionally fast heat transfer at a material saving in fuel, power and valuable space, install Aerofin fin-type coils. Famous for the accuracy of its published ratings, Aerofin can be installed to its full rated capacity. Metal-to-metal bonding and complete tinning maintain full capacity throughout the life of the installation.

Complete range of types and sizes. Expert engineering service available on request.

AEROFIN CORPORATION

410 South Geddes St., Syracuse 4, N. Y.

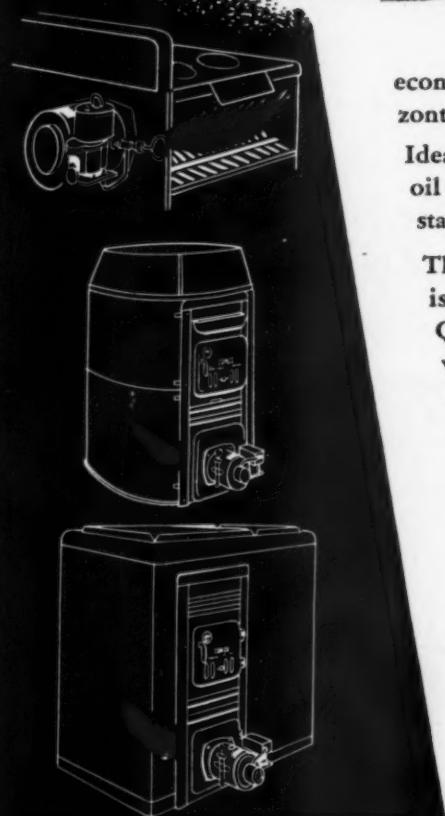
NEW YORK • CHICAGO • CLEVELAND • DETROIT • PHILADELPHIA • DALLAS • MONTREAL

CONCO

Means...

MODERN, THRIFTY

Oil Heat



CONCO ENGINEERING WORKS

MENDOTA, ILLINOIS

Here at last is a revolutionary new oil burner that combines economy, versatility and dependability... the new Conco-Breese horizontal oil burner.

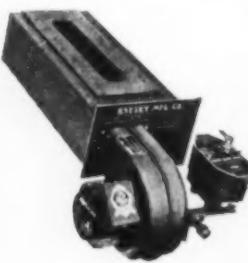
Ideal for the heating plant in small homes, the Conco-Breese horizontal oil burner can be installed at much less cost while providing substantial fuel savings over ordinary high pressure oil burners.

This modern vaporizing oil burner, available in $\frac{3}{8}$ and 1 gph models, is adapted easily to most sizes and shapes of combustion chambers. Quickly installed in all types of heating equipment including hot water heaters and cooking ranges. Assures uninterrupted operation and maximum economy in fuel consumption through its simplicity of construction and operation.

The Conco-Breese horizontal oil burner provides modern, thrifty heat—typical of all Conco equipment. Its economy and wide range of adaptations make this sensational new burner a real profit-maker for Conco distributors and dealers.

CONCO
heat





OIL BURNERS

Unique among oil burners, Kresky burns a long flame with mechanical air induction producing quick, clean, intensive heat at low cost. Simple in design—trouble free in operation. In use throughout the world.



FLOOR FURNACES

Originators of the oil burning floor furnace KRESKY is the only oil-fired floor furnace with forced air circulation bearing the Underwriters' label. Dual-wall or floor register. Manual or thermostatic control. Requires only 30" clearance. Four sizes...easily installed.



FURNACE UNITS

Now restricted in production due to material shortages, the Kresky line of oil-fired furnaces for central heating includes various types covering practically all the requirements for small homes.



RANGE BURNERS

Standard equipment in practically all leading ranges, Kresky range burners, both commercial and domestic, enjoy steady demand. With the new Horizontal Domestic Burner, oil, fuel or rubbish can be burned.

Why

KRESKY DEALERS ARE

"IN THE MONEY"

DEMAND today is for LOW COST HEAT for small homes. Kresky has the right answer for contractors and owners... the *profitable* answer for dealers. ★ BUYERS want LOW OIL CONSUMPTION. Kresky patented mechanical air induction provides maximum combustion efficiently... S-T-R-E-T-C-H-E-S the oil supply. ★ SIMPLICITY in design... durability in construction, dependability in operation... all PAY OFF in LOW UPKEEP. The "nearest thing to trouble-proof" ... even operates *during current interruption*. ★ MULTIPLE LINE covering MANY USES means year 'round market... steady profits. ★ *Due to recent doubling of manufacturing facilities we are making immediate shipments.*

WRITE FOR DEALER FRANCHISE PLAN

LISTED BY UNDERWRITERS'
LABORATORIES



Oil
BURNERS

KRESKY MFG. CO., INC.

Pioneers in Oil Burning Equipment Since 1910

PETALUMA, CALIFORNIA

HEATING • COOKING • HOT WATER • INDUSTRIAL



WYSONG
&
MILES CO.
NO.410

FOR MORE PRODUCTION AT LOWER COST

HERE is the versatile machine tool that does many sheet metal jobs quickly and profitably. A convenient, well proportioned, rugged machine, easy to operate and to adjust, for burring, turning, wiring, beading, crimping, elbow edging, slitting and other operations. Power drive enables operator to use both hands to manipulate work. Starting switch mounted on frame within easy reach. Foot or hand operated cup-type clutch can be locked for continuous motion. Upper shaft adjusts vertically by crank screw or foot treadle; laterally by convenient screws. Interchangeable rolls. Motor, clutch and gears all enclosed within semi-steel frame.

Save valuable production time in your plant with the multi-purpose No. 410 Combination Sheet Metal Machine. WYSONG and MILES 100% jig and fixture construction is your guarantee of uniformly superior machines.

Write for detailed information.

WYSONG and MILES CO.

GREENSBORO, NORTH CAROLINA

DESIGNERS AND BUILDERS OF MACHINE TOOLS FOR OVER 45 YEARS

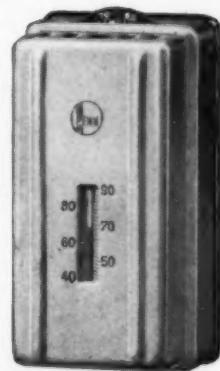
are all automatic controls ALIKE?



DAY-NITE TEM-CLOCK



TEMTROL



● All present-day automatic controls are good. They all perform similar functions in controlling automatic heating systems. *But there are differences* in controls just as there are differences in other mechanical products.

They differ in appearance, in mechanical and electrical design, in the materials used, in ease of installation, in their operating dependability and *in their accuracy in controlling temperatures.*

For example, PENN Temtrol . . . the room thermostat with the *heat-anticipating* feature . . . assures maximum heating comfort by keeping room temperatures extremely close to the selected level. This is made possible by a design that introduces "artificial" heat within the thermostat. Thus the thermostat

has the uncanny ability to *anticipate* heat requirements before room temperatures change materially.

Then, there's PENN Tem-Clock. This electric clock provides *fully automatic control* of night set-back temperature . . . resulting in greater comfort, convenience and fuel economy. It can be installed in any room desired by the purchaser, *regardless of the location of the thermostat.*

"Extras" like these are found in all PENN heating controls . . . primary controls, limit switches and relays. On your future heating jobs, use PENN Controls. **Penn Electric Switch Co., Goshen, Indiana.** In Canada: Penn Controls, Ltd., Toronto, Ont. **Export Division: 13 E. 40th St., New York 16, U. S. A.**

PENN

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS



*As Outstanding as a
Plug Hat at a dog fight*

MONCRIEF'S NEW

**CAST IRON • GAS FIRED
AIR CONDITIONING UNITS**



HERE'S WHY

Radiators are cast in one piece — with easy-to-remove clean-out ports.

Round cast iron combustion chamber — rugged, simple, leak-proof.

Not one single vertical joint in the entire heating assembly.

"No hot spots" that promote cracking and short life.
"No cold spots" that might cause condensation.

Entire heating element can be removed for inspection or cleaning in 15 to 30 minutes.

These are just a few of the outstanding, "Years Ahead" engineering and construction features that make these new Moncrief units incomparable in cast iron, gas-fired heating equipment.

These units meet the American Gas Association's stringent temperature requirements on both high and low limits.

THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS

MONCRIEF
SINCE 1893

FURNACE PIPE AND FITTINGS



You don't have to sell them **HEALTH!**

Every home owner knows the discomforts of dry hot air. Health authorities agree that moist air prevents colds and respiratory ailments, promotes health and vigor. Every home owner wants the kind of healthful comfort that is provided only by Thermo-Drip Heat Regulated Humidifiers.

Thermo-Drip Humidifiers moisten the air as it is heated—in direct proportion to temperature. Thermo-Drip Humidifiers positively regulate water feed and accurately control the amount of evaporation so that the minutely correct percentage of moisture is added to the air at all times. Thermo-Drip equipped furnaces give your customers the kind of health protection that doctors approve. Thermo-Drip Humidifiers are manufactured from the finest materials and are designed and engineered to simplify your installation. Made in a variety of pan sizes for every type or make of warm air furnace. Write today for all the facts.

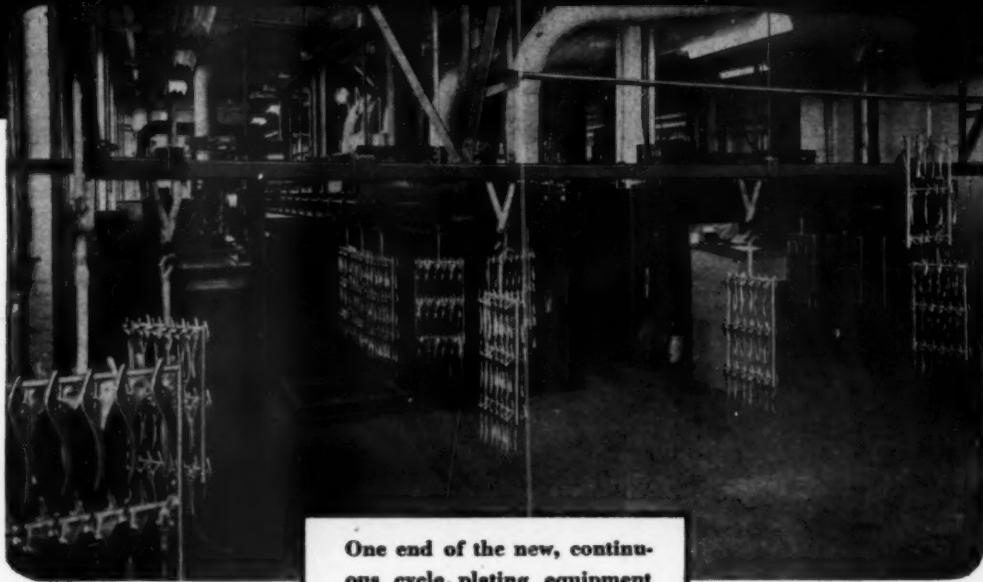
THERE'S A THERMO-DRIP HUMIDIFIER FOR EVERY TYPE OR MAKE OF WARM AIR FURNACE

THERMO-DRIP
HEAT REGULATED
HUMIDIFIERS

Made by
Automatic HUMIDIFIER CO.
CEDAR FALLS . . . IOWA

If you want *Finely Finished Tools*
insist on

CRESCENT*



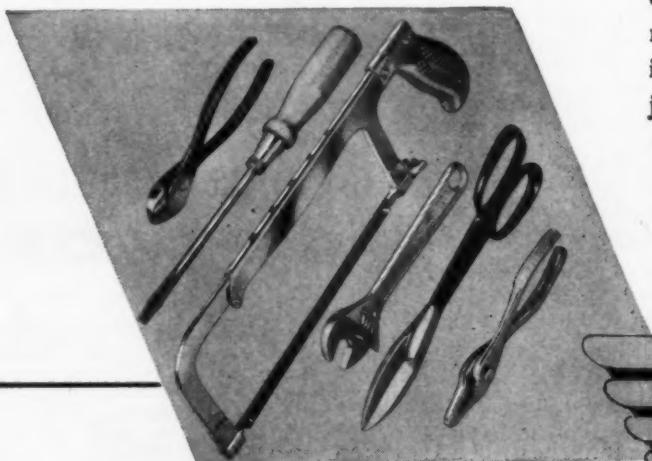
Fine tools deserve the finest finish obtainable, not only for appearance, but for lasting protection against rust and corrosion. Crescent Tools are made in a variety of finishes . . . baked enamel for snips, punches and chisels; blued finish for cut-

One end of the new, continuous cycle plating equipment in the Crescent plant.

ting pliers, end cutters; highly polished steel;

parkerizing; nickel and chrome plating for Crestoloy and Crescent Wrenches.

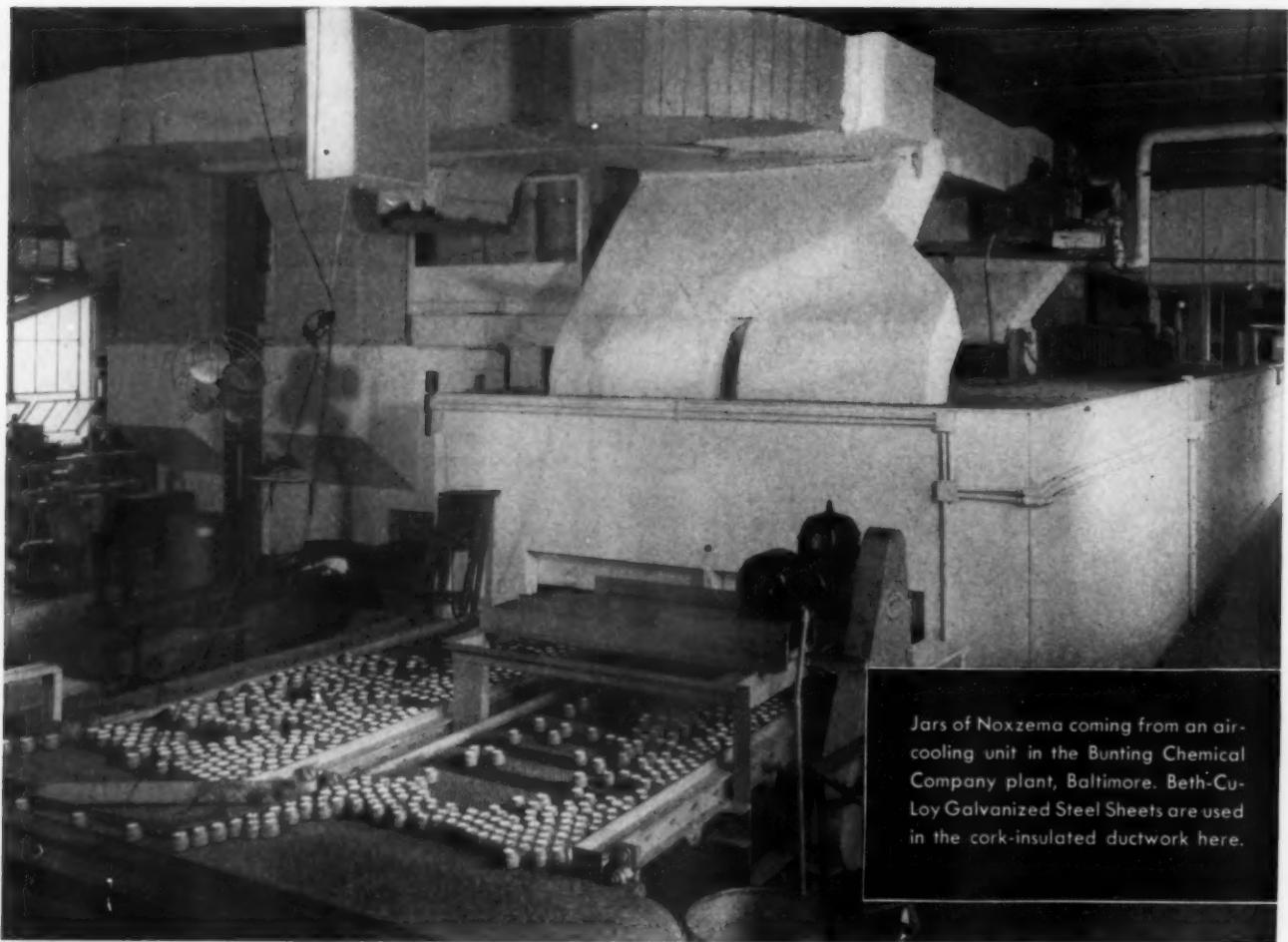
Entirely automatic, the nickel and chromium plating equipment at Crescent is the very latest and most efficient, insuring best results. Tools remain in the various baths . . . de-greasing, cleaning, rinsing and plating . . . just the proper length of time. They come out bright and shining, ready for shipment to the hardware stores of the world, where they will be sold to tool users who demand the best.



***CRESCENT TOOLS**
Give Wings to Work

CRESCENT TOOL COMPANY, Jamestown, N. Y.

*"CRESCENT" is our trade-mark registered in the United States and foreign countries for wrenches and other tools. "Crescent" tools are made only by Crescent Tool Company of Jamestown, N. Y., and are sold by leading distributors everywhere.



Jars of Noxzema coming from an air-cooling unit in the Bunting Chemical Company plant, Baltimore. Beth-Cu-Loy Galvanized Steel Sheets are used in the cork-insulated ductwork here.

HOW *Air-Cooling* SAVES TIME IN HANDLING OF MEDICINAL PREPARATION

The Bunting Chemical Company of Baltimore use modern air-cooling methods to speed the continuous-line packaging of their products.

Formerly, jars of their medicinal preparations were too hot to handle when they left the filling machine. They had to cool for a full day before they could be labeled, capped and packed in boxes.

Now, these jars take a quick trip on a wire conveyor belt that runs through an air-cooling unit. Their temperature is reduced immediately, and as a result they can be shipped the same day. No time is lost, no extra handling is necessary.

This application of air-cooling is typical of the trend toward greater use of temperature and humidity control to improve processes and step up production in many lines of manufacturing.

Air-conditioning requires good ductwork and that, in turn, calls for galvanized steel sheets able to resist corrosion. Beth-Cu-Loy galvanized steel sheets are now used in many industrial air-conditioning installations throughout the nation. The copper-bearing steel base used in these sheets resists rust 2 to 2½ times as long as does ordinary carbon steel. On top of this, Beth-Cu-Loy sheets have a bright coating of Prime Western

zinc that acts as a further defense against corrosion. Remember the name Beth-Cu-Loy whenever you figure on any type of air-conditioning installation for industrial purposes.

Beth-Cu-Loy
GALVANIZED
Steel Sheets



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation



*Their game room
becomes your display room*

...when you install RICHMOND

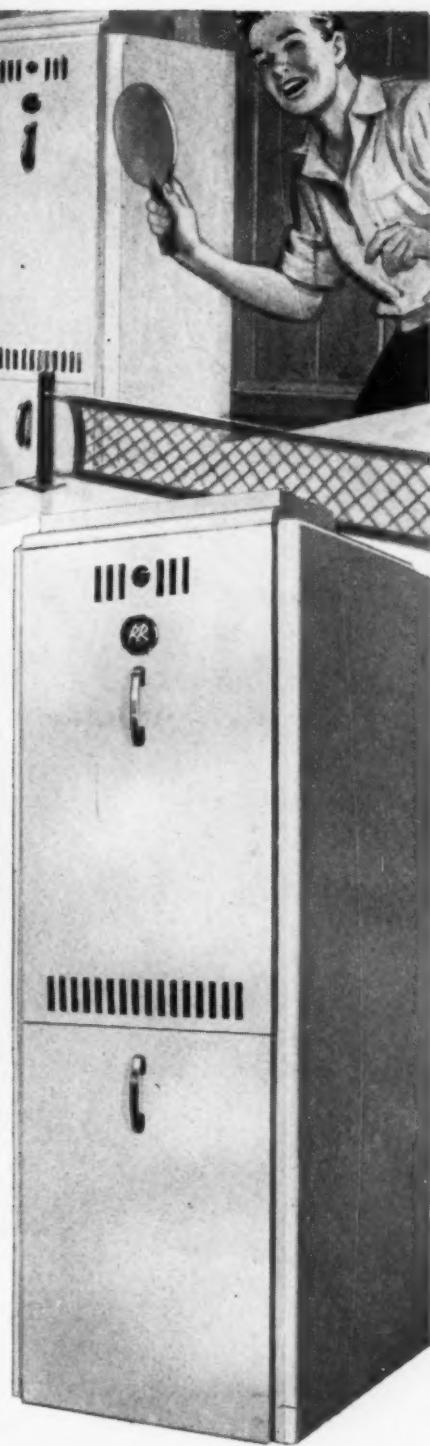
THE Richmond Winter Air Conditioner attracts attention wherever it is installed. Owners like to show their friends its smart white enamel jacket. A Richmond Winter Air Conditioner never needs to be hidden because it is never dull or dingy—it uses clean gas heat.

Completely packaged, it is quickly installed. Quality-built, it reduces call-backs—assures you of full profit. Engineered for longer life, it includes the following features: Heat exchanger cast in one piece of

chrome-iron alloy; Limit control to prevent overheating; Easily renewed spun glass filters; rubber-mounted blower fan.

Richmond Winter Air Conditioners are covered by both AGA approval and a one-year replacement guarantee. They are available in four sizes: 66,000, 90,000, 115,000, and 140,000 Btu input.

Ask your wholesaler or write us for name of nearest Richmond wholesaler. Richmond Radiator Company, 19 East 47th Street, New York 17, N. Y.



Shipped Completely Assembled

Quickly installed. Addition of special cowl converts to floor-type unit.

FACTORIES AT METUCHEN, N. J., MONACA, PA., NEW CASTLE, DEL., UNIONTOWN, PA. (2)



RICHMOND RADIATOR COMPANY
Affiliate Reynolds Metals Co.

Enamel Cast Iron Ware • Vitreous China • Flame-Glow • Gas Radiators • Gas Winter Air Conditioners • Gas Gravity Furnaces • Radiators

Coming faster

.... still not
quite enough



HUSSEY



More Hussey Copper is being made today than at any time in the 100-year history of the product . . . but still not quite enough to fill the demands of all who prefer *Hussey pure Copper*. When you design for lifetime dependability, durability, versatile fabrication and economy—use Hussey Copper, there is a Hussey warehouse near you to service your requirements with utmost accuracy.



C. G. HUSSEY & CO.

(Division Copper Range Co.)

ROLLING MILLS AND GENERAL OFFICES • PITTSBURGH, PA.

Hussey Warehouses Carry Stocks of Copper and Brass Products for Prompt Delivery



FROM COAL, GAS AND OIL FURNACES
TO BLOWERS, STOKERS, OIL BURNERS

it's **VICTOR**

Wherever you find a VICTOR dealer you find a man who knows he is selling the best in heating equipment. Knowing this, he sells with confidence. He knows that every easily installed VICTOR will give years of unusual heating satisfaction with minimum of service. Victors sell faster. More sales mean more money.

CONVERSION EFFICIENCY . . . VICTOR boiler plate steel furnaces, welded and riveted are ideally constructed for conversion from coal to oil or gas with practically no loss in efficiency.

Get ready now, for 1948. Begin now to install VICTOR coal, gas and oil furnaces with the **EXCLUSIVE** Heat Radiating **FINS**. Each one you sell now, develops more eager prospects for a bigger year in '48.

FURNACES • OIL BURNERS • GAS BURNERS • STOKERS • BLOWERS • ACCESSORIES

HALL-NEAL FURNACE Co.

VICTOR Quality Furnaces Since 1890

1322 N. CAPITOL AVENUE • INDIANAPOLIS 7, INDIANA



From the cradle to

**HERMAN NELSON PRODUCTS
SERVE MILLIONS IN AMERICA**



New Plant of Miami Home Milk Producers, Miami, Fla.

Architect — L. R. Christie, Miami, Fla.
Consulting Engineer — W. T. Efting, Miami, Fla.
Contractor — Norton R. Ganger Co., Miami, Fla.

From Maine to California . . . Herman Nelson Heating and Ventilating Products maintain comfortable and healthy air conditions in many of the finest stores, industrial plants and office buildings.

Because the average man spends about 80 per cent of his entire lifetime indoors, it is important that all buildings in which he goes to school, works and

plays be properly heated and ventilated.

Since 1906, The Herman Nelson Corporation has been building quality heating and ventilating equipment for public, industrial and commercial buildings. Leading Architects, Engineers and Contractors, as well as Owners, know that the use of Herman Nelson Products will assure maintenance of desired air conditions.



THE HERMAN NELSON CORPORATION

Since 1906 Manufacturers of Quality Heating and Ventilating Products

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Palmer Plumbing Supply Co., Laconia, Rochester.

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PENNSYLVANIA
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Hajoca Corporation, Richmond, Norfolk, Danville.

VERMONT
Roanoke, Staunton.

VERMONT
Western Maryland Supply Corp., Winchester

VERMONT
WASHINGTON
J. G. Bowles Co., Seattle.

VERMONT
Marshall-Wells Co., Spokane.

WEST VIRGINIA
Trimble & Lutz Supply Co., Wheeling.

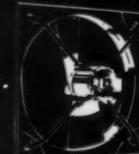
WEST VIRGINIA
The Universal Supply Co., Parkersburg.

WISCONSIN
Cordes Supply Co., Milwaukee.

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Wisconsin River Supply Co., Wausau.



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Herman Nelson
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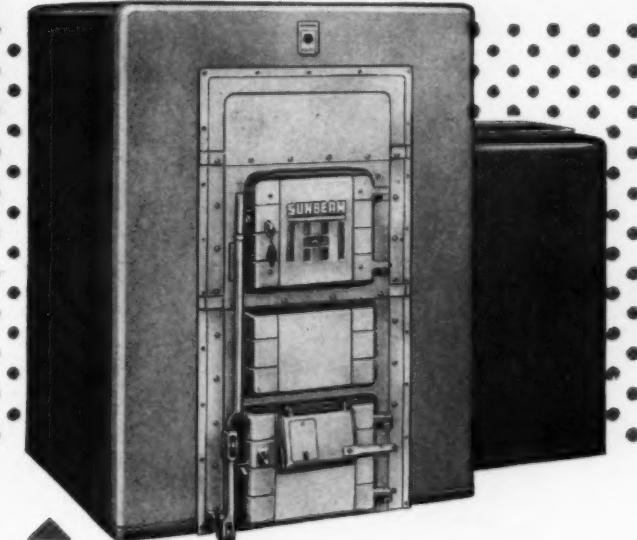
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● You can assure customers of lasting satisfaction when you sell American-Standard's Sunbeam line. For these products have literally everything that customers look for in warm air furnaces and winter air conditioners: good looks, efficiency, economy and long life. And today, with more and more Sunbeam units being produced, your Wholesale Distributor will have more of these units for you. Keep in close touch with him, so that you can supply these quality units to your customers. And remember! There is the Heating & Plumbing Finance Corporation convenient Time Payment Plan which is available for modernization work. For details, see your Wholesale Distributor. **American Radiator & Standard Sanitary Corporation, P. O. Box 1226, Pittsburgh 30, Pennsylvania.**



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LOOK FOR THIS MARK OF MERIT—It identifies the world's largest line of Heating and Plumbing Products for every use . . . Including Boilers, Warm Air Furnaces, Winter Air Conditioners, Water Heaters, for all fuels—Radiators, Convector, Enclosures—Gas and Oil Burners—Heating Accessories—Bathtubs, Water Closets, Lavatories, Kitchen Sinks, Laundry Trays, Brass Trim—and specialized products for Hospitals, Hotels, Schools, Ships, and Railroads.



Most cherished Christmas Gift The World's Finest Clock Thermostat



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- ✓ Special Window Banners
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You make *everyday* a holiday for the homemaker when you install the freedom-giving, fuel-saving Magic Dial

Clock Thermostat. The gift that offers the entire family added comfort and convenience . . . 'round the clock. It gives them an extra advantage, too, in the *exclusive* Magic Dial which tunes heating systems to outdoor conditions and individual comfort preferences.

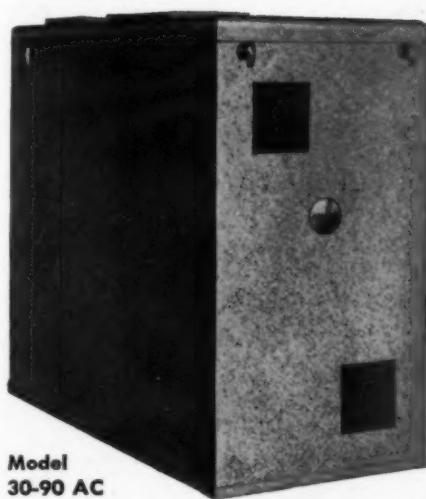
Progressive dealers recognize the timely opportunity to increase profits by selling the beautiful Magic Dial Clock Thermostat for Christmas giving — and luxurious living.

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MANUFACTURERS OF AUTOMATIC CONTROLS BEARING THE TRADE MARK NAMES
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A COMPLETE LINE OF TWIN CONTACT CONTROLS FOR ALL TYPES OF HEATING SYSTEMS



Model
30-90 AC

UNLIMITED!

The New OIL-FIRED **NIAGARA**

Brings Winter Air Conditioning to
City and Country Homes **ANYWHERE**

• Your installations of winter air conditioning furnaces are not limited by the locations of homes when you concentrate on Niagara heating equipment. With the new Niagara Model 30-90AC Oil-Fired unit you can supply modern winter air conditioning **ANYWHERE**.

Model 30-90AC is an efficient unit for low cost operation and many years of trouble-free service. The heat exchanger is of heavy boiler plate construction, with precast insulating ceramic combustion chamber. The pressure (gun type) burner,

using lower priced No. 3 fuel oil, supplies 90,000 BTU per hour at registers, and is complete with fan switch, thermostat and protectorelay (intermittent). The blower is 11", belt and pulley type. Standard equipment includes two 16x25x2" air filters, barometric draft regulator, and cartridge-type (replaceable) oil filter. Cabinet dimensions: 52½" high, 27¾" wide, 56¾" long. Finish, chateau green Hammerloid enamel with painted inner linings.

The furnace can be supplied with or without the oil burner.

SQUARE AND ROUND **COAL FURNACES** CAST-IRON OR STEEL

Niagara Coal Furnaces are made in round and square types, with the famous Niagara cast-iron heat exchanger, and round and square models with steel combustion chambers.

Included in the complete Niagara line are gas-fired winter air conditioners and gravity furnaces for small, medium and large homes.

Write Today for the complete story of Niagara furnaces—product of 55 years' experience in manufacturing residential heating equipment. When you install Niagara, you associate with Success.



Coal-Fired Gravity
Cast Iron or Steel

NIAGARA FURNACE DIVISION • The Forest City Foundries Company • 2500 West 27th St. • Cleveland 13, Ohio

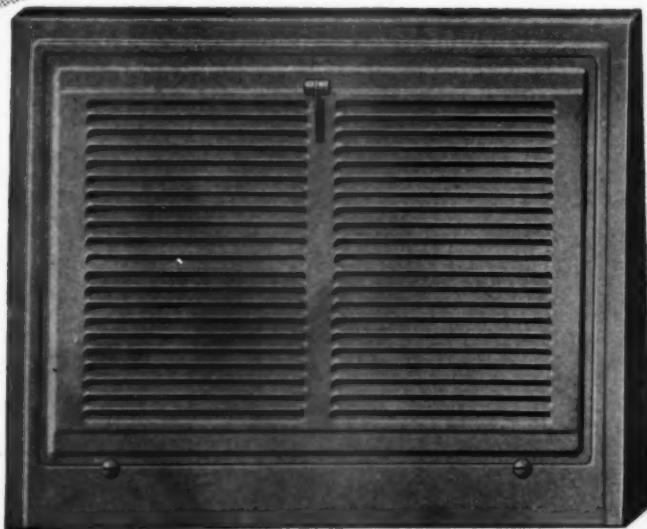
OIL-COAL

NIAGARA

AND GAS

GRAVITY AND WINTER AIR CONDITIONING UNITS

Auer
HEAT-RITE



*-the Outstanding Value
Among Gravity Registers*



Use Auer Metal Clothes
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Price is not the whole story on a gravity register. Other registers, at comparable prices, may look like Heat-Rite, but do they all have the excellence of workmanship, the careful forming and finishing that mark this Auer quality register? The Heat-Rite has closely spaced fins, with the same streamlined appearance as today's air conditioning models. It is substantial and neatly turned out in every detail, and makes the tight, truly aligned installation you want on all your warm air jobs. It has removable face, generous open area, and fins adjustable at time of installation for desired directional flow. A very important feature is the unique spring tension valve adjustment, exclusive with Auer, which really holds the valve for keeps. Heat-Rite is supplied for base or wall location, also intakes.

Compare the price, but also compare the product—and you'll see why we say this Heat-Rite is an unusual value.

Ask for Auer Register Book showing all models for air conditioning and warm air. Special Grille Catalog also sent on request.

The Auer Register Company, 3608 Payne Avenue, Cleveland 14, Ohio

Auer **REGISTERS**
& GRILLES for AIR CONDITIONING & GRAVITY

ARE YOU FOOLED BY THE FUEL SITUATION?

SOME people have the notion that oil and gas shortages are temporary and that increased fuel prices will not be maintained or go even higher.

Sure, transportation bottle-necks and limitation of storage facilities due to steel shortages are responsible for much of the present difficulty in some communities. But other factors such as the greatly increased number of domestic gas and oil heating installations; the tremendous demand for more gasoline; the change-over of many industrial plants to oil and gas; and the drain that war needs imposed upon the nation's fuel reserves—all have changed the picture and should be taken into account by every Furnace Dealer.

Will the customers to whom you are selling Single-Fuel Furnaces be able to keep warm if and when supplies of gas and oil are inadequate or too expensive?

Williamson Dealers have the answer to the fuel problem. They are selling ALL-FUEL FURNACES so that temporary shortages of OIL and GAS will not leave their customers heatless.

For customer good-will and your own satisfaction, join these dealers now. Write today for "ALL-FUEL FURNACE FACTS".

THE WILLIAMSON HEATER CO.
CINCINNATI 9, OHIO

**It's easy
to do a
good job**



WITH WHEELING COP-R-LOY PRODUCTS

A black and white photograph showing various metal products. In the upper left, a stack of 'COP-R-LOY GALVANIZED SHEETS' is shown. In the center, a 'LEAVES TROUGH' is displayed. To the right, two 'CONDUCTOR PIPES' are shown. At the bottom left, a 'ROOF GUTTERS' component is shown. On the right side, a small inset photograph shows a worker in a white shirt and dark pants working on a roof, possibly installing 'GALVANIZED ROOFING'. The background is dark, making the metallic products stand out.

**FOR A BETTER JOB EVERY TIME
INSIST ON WHEELING COP-R-LOY**

WHEELING CORRUGATING COMPANY • WHEELING, W. VA.

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DETROIT
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KANSAS CITY
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1. Provide a complete line of Heating, Air Conditioning and Commercial Refrigeration—an opportunity to make a profit every day of every season!
2. Supply you with products renowned for their efficiency and engineering — backed by Chrysler Corporation's great engineering facilities.
3. Give you public acceptance of these products through hard-hitting national advertising support, with inquiries passed on to you.
4. Furnish practical, usable sales training material to help build your sales.
5. Provide a complete set of selling tools including quick turn charts, literature, specification sheets and other sales data on all items in Airtemp's Triple Line.
6. Give you expert sales and service help and supervision through Chrysler Airtemp factory representatives conveniently near your place of business and available to help you.

NOW is the time to put yourself in a position to make money with Chrysler Airtemp. Some territories are still available for dealerships for one, two or the full Triple Line. Write for complete details—

Airtemp Division of Chrysler Corporation, Dayton 1, Ohio
In Canada: Therm-O-Rite Products, Ltd., Toronto

Automatically Yours



HEATING • AIR CONDITIONING
COMMERCIAL REFRIGERATION

FACTORY-TRAINED FIELD SERVICE AT KEY POINTS



These stations are manned by factory-trained experts, who use only genuine Webster Electric parts and are equipped to give factory service to every oil burner dealer. Every fuel unit sent to a Webster Electric Authorized Service Station receives the same expert handling as given at the factory. Additional service stations are constantly being established at strategic locations.

WEBSTER ELECTRIC FUEL UNITS and TRANSFORMERS...

Help to Increase Profit... Satisfy Customers!

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Colorado: Denver, SKELLEY HEATING EQUIPMENT CO., 1234 Speer Blvd.

Connecticut: Hartford 6, BELL PUMP SERVICE CO., 44 New Britain Ave.

Connecticut: New Haven, BELL PUMP SERVICE CO., 750 Congress Ave.

D. C. Washington, R. E. MICHEL CO., 2219 5th St., N. E.

Illinois: Chicago 44, W. C. MORSE CO., 4629 West End Ave.

Illinois: Winnetka, NORTH SHORE HEATING SUPPLY CO., 812 Oak St.

Maine: Portland 3, REFRIGERATION & OIL BURNER SUPPLY CO., 133 Marginal Way.

Maryland: Baltimore 2, R. E. MICHEL CO., 1011 Greenmount Ave.

Massachusetts: Cambridge, CRONIN SUPPLY CO., 60 Broadway

Massachusetts: Framingham, OIL HEATING SUPPLY CO., 3 Arcade

Massachusetts: Malden, E. L. KIMBALL CO., 25 Lynde St.

Massachusetts: Springfield, BELL PUMP SERVICE CO., 888 Main St.

Massachusetts: Wollaston, W. S. PLUMMER, 109 Lincoln Ave.

Michigan: Detroit 2, WM. G. BOALES & ASSOCIATES, 6429 Hamiton Ave.

Michigan: Detroit 3, HYDRAULIC & PUMP REPAIR CO., 18304 Woodward

Minnesota: St. Paul 4, THERMAL CO., INC., 2410 University Ave.

Missouri: St. Louis 10, CRESCENT PARTS & EQUIPMENT CO., INC., 825-831 S. Boyle Ave.

New Hampshire: Portsmouth, EARL H. CLARK, 510 Sherburne Road

New Jersey: Hawthorne, UNIVERSAL ENGINEERING CO., 344 Wagarow Road

New Jersey: Elizabeth, CERTIFIED FUEL UNIT SERVICE CO., 600 Spring St.

New York: Albany, CERTIFIED FUEL UNIT SERVICE CO., 1018 Central Ave.

New York: Bronx 61, VIN'S OIL BURNER PARTS SUPPLY CO., 3614 E. Tremont Ave.

New York: Brooklyn 16, THE CAPSON CO., INC., 106 Rogers Ave.

New York: Flushing, THE CAPSON CO., INC., 40-16 149th Place, Murray Hill Plaza

New York: Rochester, ROCHESTER FUEL PUMP SERVICE, 517 Jay St.

New York: Scarsdale, A. B. WOLLE & CO., 69 Harvey Road

New York: North Syracuse, BUFFALO PUMP SERVICE CO., 440 S. Bay Road

North Carolina: Burlington, ALLEY & RADER SERVICES, 1006 Webb Ave.

Ohio: Toledo 2, TOLEDO AUTO ELECTRIC CO., 35 17th St.

Oregon: Portland 14, INDUSTRIAL CONTROL CO., 1412 E. Burnside

Pennsylvania: Philadelphia, CERTIFIED FUEL UNIT SERVICE CO., 3412-14 W. Allegheny Ave.

Rhode Island: Providence 3, PROVIDENCE PLUMBING SUPPLY CO., INC., 47 Pine St.

Rhode Island: Providence, R. I. FUEL PUMP SERVICE CO., INC., 847 N. Main St.

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WEBSTER ELECTRIC FUEL UNITS

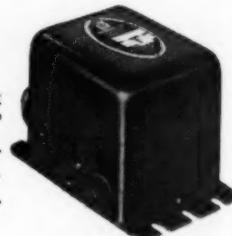


Equipping an oil burner with a Webster Electric Fuel Unit is a guarantee of long life and trouble-free performance from this vital part.

Quality is the first consideration in their manufacture. Quietness . . . constant pressure . . . quick cut-off . . . simple, thorough air bleeding . . . lubricated outboard bearing . . . no oil spillage when servicing strainer . . . easy servicing throughout. These are features appreciated by dealer, user and manufacturer alike.

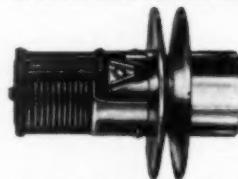
In Canada, Webster Electric Fuel Units are made by Canadian Acme Screw and Gear Ltd., Toronto

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Here is the component that is most readily and confidently "forgotten," because it does its job of instant, sure-fire ignition year in and year out—earning its leadership by its outstanding quality.

Top performance of these units is assured by their painstaking construction. Pure mica, which does not deteriorate with age, is used for coil insulation. Coils are wound with exacting care and assembled on a lamination of nonaging material. Unique metal shielding accomplishes the unusual in radio interference elimination.



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No "blow cold, blow hot" with Thermodrive. Here is a newly perfected air-flow regulator that gives gently ascending and descending air velocity, proportioned accurately with temperature as generated by the heating system. Simple and practical in construction . . . easy to install. Send for full information today.

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RACINE WISCONSIN

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AND FAIR DEALING AN OBLIGATION"

AMERICAN ARTISAN, November, 1947



PLIAVANE REGISTERS

FOR BETTER CONTROL OF AIR CONDITIONING DISTRIBUTION

When you recommend and install Tuttle & Bailey Pliavane Registers for the control of air flow in residential air conditioning, you can be sure you are offering equipment that meets every distribution requirement . . . trim, attractively-designed equipment that harmonizes with modern homes.

In a single unit — back blades readily adjustable for upward or downward deflection of the air stream . . . face bars individually adjustable for horizontal deflection. Back blades provide even distribution, uniform velocity . . . minimized resistance, noise elimination. Available in a range of sizes for sidewall or baseboard installation, with air intakes to match supply registers.

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REGISTERS MAY BE USED
WITHOUT FRAMES . . . OR WITH
ANY STANDARD INSTAL-
LATION FRAME

ASK YOUR JOBBER TODAY

TUTTLE & BAILEY



NEW BRITAIN, CONNECTICUT



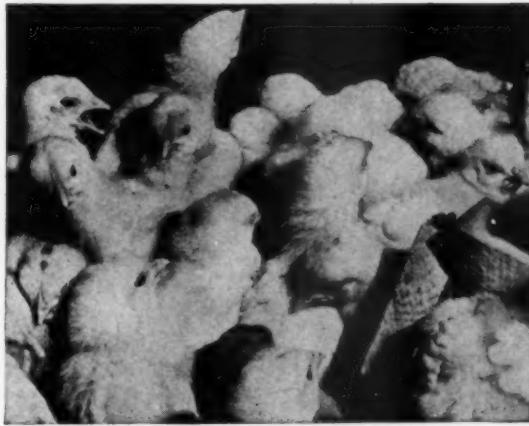
1. HI THERE! Want the GO sign for more and better sales—easier sales? Then sell on time with Allied Building Credits, Inc. "No cash down, easy monthly payments."



2. "AND OF ALL THEIR WORLDLY GOODS"
—over one half will be purchased on the instalment plan. By actual record half of what is sold in the U.S. is sold on time payments. Are you selling the easy way—the way people like to buy?

3. PERFECT CONTROL . . . the juggler has it, and so do you, when you sell with ABC. For you offer the convenient terms right in your own office. ABC terms are your terms. You control the sale.





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Complete instalment note and mortgage services for the building industry exclusively.

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The Department Store Idea

When you think of a Ryerson Plant, picture a huge department store featuring all kinds and shapes of steel. In place of the ordinary sales personnel, think of a large staff of experienced steel men—a sales department that's been carefully trained to guide your steel purchasing—to see that you get the exact steel you need for the job at hand.

And, when you think of Ryerson Steel-Service, think of a smooth-flowing system of steel supply that eliminates every unnecessary delay between order desk and point of delivery. Think of the most modern steel storing, cutting and shipping methods—methods based on more than a century of performance. And remember that Ryerson Steel-Service functions with the same efficiency and promptness

whether your order calls for pounds or tons.

Naturally, today's great demand for steel frequently unbalances our stocks. But if the steel you need is not immediately available, we'll gladly do everything possible to supply you with a practical alternate.

What does it all add up to? Well, just about the last word in steel-buying convenience. And it's all yours when you contact a Ryerson Plant for any steel requirement.

Joseph T. Ryerson & Son, Inc. Plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.

RYERSON STEEL

AMERICAN ARTISAN, November, 1947

AMERICAN ARTISAN

RESIDENTIAL
AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

ARE RESTRICTIONS RETURNING?

Rationing, price control, or some sort of planned economy looms as a possible means to continue our huge food exports and to provide a brake on the publicized price boom. Some organizations are already on record as favoring the return of controls. When it requires a pocketful of money to buy a bag of groceries, agitation for economic regulation—controls—is apt to find sympathetic ears because food prices are pointed out as prime evidence of the need for restrictions. However, this is strange logic when we have seen surplus food destroyed or taken off the markets and stored in order to maintain prices. If controls are imposed as a result of this welter, both food and fuel are likely to be considered as commodities which most urgently require restraint.

Warm air heating contractors realize that control of fuel would contribute further to the public concern about the nation's fuel supply and cause further apathy toward heating modernization which is now partially restricted by discouraging conversion to a new fuel. Our industry has been restrained by one problem or another since pre-war years, but the current restrictions imposed by necessity by the fuel industries have been flexible as compared with those by statute. There has been the freedom to arrange for the installation of heating equipment as conditions in different localities permit. Government control would not permit the freedom of judgment now enjoyed. Instead of the warm air heating contractor, the homeowner, and the fuel distributor getting together and deciding if local conditions permit release of a new fuel to a new user, the regulations would decide.

Some point to the time required to get a rationing or price control program started, and to the coming election year, as reasons that this is not an opportune time to initiate controls. Others point to the current efforts to conserve food by voluntary compliance as a diplomatic preliminary to controls—especially if the conservation program fails. At the beginning of winter it is difficult to foresee how strong the pressure for controls, as an emergency measure, may become as the winter advances. There is little evidence to show that the voluntary food conservation program is receiving public support. As the winter advances we most likely will be called upon to save fuel to "heat Europe" and the same apathy toward conservation of fuel may be

expected, for we have long been admonished to conserve natural resources, as an inheritance, for our own use and this has contributed to an antipathy toward sharing our reserves in the topsoil and underground.

Much of the current discussion about high prices—and most of the proposed remedies—ignore the factors which have brought about a higher level of prices. We have had too much name calling and finger-pointing, and too much "looking for the culprits" and not enough consideration of the facts. Economic pressures cause prices to seek new levels. A study of prices after other wars indicates rises similar to those we are now experiencing. Whether our present economy will follow the sharp declines experienced in other post-war periods is uncertain. The pent-up demand for durable goods is taxing our productive capacity to the limit. In time this capacity can be increased by plant expansions and new and better machinery.

Also, there is an unprecedented foreign demand for our goods, especially farm products. Large government purchases of food for export (as outright gifts) have introduced a speculative element in these markets. So the price of food is a spectacular example of price increases, but it is unfair to conclude that we have runaway prices. We are apt to forget that many of the components of the cost of living have changed little and some have actually declined.

Insistence for controls—at least by some minority groups—is increasing. Whether they will be imposed and extended to fuel cannot be foreseen. One of our associations reports that a federal home loan agency will no longer approve oil heating equipment unless the owner has a contract assuring a supply of fuel oil. Coal mine operators have warned that there will be serious coal transportation problems this winter from the lack of coal cars. There is no evidence to show that the gas pipeline facilities have increased sufficiently to permit opening the gates to gas installations.

All fuels require transportation. If control is required to spread the supply, we at least should oppose regulations governing the installation of heating equipment. There should be no restriction of new efficient equipment which will contribute to relieving the transportation shortage.

Arnold Kruckman's

Washington Letter



"State of The Union"

AN unpublicized incident of major importance to the industries of the economy of the nation occurred on October 17, when the several prime Departments of the Federal Government delivered to the President a report on the State of the Union. There is little doubt that it was prepared on suggestion from the White House, and that it was intended to have a decisive bearing on the judgment that was in process of crystallization concerning the question whether or not Congress should be called in special session. Inevitably, the major influence which shaped the report is what the men who run the Government think and know about the international situation. The Department of National Defense—Army, Navy, and Air Forces—apparently took a gloomy view of the prospects. They naturally are more sensitive to the forces at large in the world than are most other Departments, because it will be their job to defend the Nation in case of any explosion. It is understood they stressed the unpreparedness of the industries upon which the National Defense must lean, and that they suggested it would take at least 90 days to reach even some vestige of the necessary stance. If the National Defense people are not over-pessimistic it seems probable that we have allowed most of our industries, used in the last war, to slack down into something approaching defense disintegration. Apparently we need stockpile operation, re-equipment of many plants, re-vitalization of our transportation systems, and re-assembly of the essential work forces. It has been pointed out, for instance, that we have only 100 B-29 planes, capable of immediate use, and that we have allowed the vast aircraft industry we developed during the war to decay into almost nothing so far as defense purposes are concerned. Our National Defense people sincerely feel that at least the five most important aircraft plants should be kept to comparative efficiency by the expenditure of, say, \$6,000,000 per plant, or \$30,000,000 overall, per year. It is pointed out that it takes three to five years to gear up the industries of the nation to the

production as well as assembly of strategic materiel. This is regarded as true in relation to the units and sub-units produced by the sheet metal manufacturing and assembly industries as well as other parts of the economy.

Some Specific Needs

The report presumably pointed out that we are desperately in need, at this time, of all the things that go into homes, and into the new homes that are under construction, as well as the many prospective new homes that must come into existence, war or no war. Assuming, for the sake of the argument, that we are heading towards a war, or towards a State of National Emergency, there will be a still greater and more urgently pressing need for homes, and the equipment, such as sheet metal fabricators make, than would be in existence under the non-war pressure of an expanding population, and the current lack of housing, equipment, and corollary supplies. Government figures reveal in the past *eight years* the population has increased by 14,000,000 persons, chiefly stemming from the amazing birthrate. We now are said to have, according to Government estimates, a population of 145,000,000. Three years from now, in July, 1950, it is estimated by the Census people we will have approximately 151,000,000 population. If we have no war, within three years our expansion in population will be far beyond what the experts expected even by 1965. Bear in mind how far wrong the experts can go when you recall that just a few months ago the Census people predicted we would reach our present figure of 145,000,000 between 1949 and 1950. It used to be the popular indoor sport of those who played with the data of vital statistics to assert that when we reached 150,000,000 we would go in reverse, and population would decline. There is obviously not the remotest indication of this probability at the present time when births are running at the rate of 325,000 per month, or an eight year total equal to the population of all

Canada, and a 10 year increase equal to half the population of the British Isles, and of France. These data are profoundly significant to your industry. After present uncertainties have been licked, one way or another, this almost incredible growth means an enormous prosperity.

Will Europe Help Itself?

It is understood the report sent to the White House reflects the still pressing need for furniture, for heating equipment, and for all the equipment and appliances that go into the kitchen, and other parts of the home, made of metal. It also is supposed to show that the "Marshall Plan" has not stood the acid test of the visits of the Congressmen to Europe. The fault is not the fault of Gen. Marshall. He never intended that we should be the world's Santa Claus. He strove to suggest that Europe, especially, and the rest of the world in general, with our help, help itself. The desperate drive to induce us to forego food, to feed Europe, has flopped. From a diplomatic standpoint that means we have lost face, over there. And when we lose face, our opposition, the Russians, gain kudos. Moreover, they will move in where our prestige dims.

The Europeans want what we have, but they are touchy about ANY conditions with what we give. They have been so used to our unconditioned lavishness that they apparently had no doubt we would pour out money, credits, materials, goods, services, equipment, food, fuel, and fertilizers, as gifts. The idea that they should dig up the resources, which we know are there, and assemble them to help themselves, has raised more or less hell, so far as their disillusioned concept of us is affected. They now know that we know they have considerable gold and dollars over here, as well as other liquid investments, and that this hidden capital, here as well as in Switzerland and in other European countries, is collectively immense. Our own figures reveal that the foreign nations, mostly European, outside of the resources they have in the United States, still have approximately \$30,000,000,000 in gold and dollar assets alone. Most of this enormous wealth is to be found in Switzerland, France, Britain, Belgium, and Greece, as well as in sizable caches in Scandinavia and Luxembourg. It is just as plain to the Europeans, now, as it is to us, that we have become aware the canny folk over there have this liquid wealth stowed away, and that we no longer are convinced that our Government is justified in digging into our resources by the tax route, because we think the European Governments should force their own wealthy people, as well as their tight peasants, to disgorge. That, in the simplest terms, is the main issue now, and it is the principal reason why we are losing popularity over there even more swiftly than we have lost it in the past two years. And, obviously, as we go into the international doghouse the Russians gain favor.

Some Crisis Soon

In the light of this situation, together with the pressures that are growing more acute from many sources, it is possible to understand why businessmen of your industry, as well as from many other parts of

the national economy, who have recently visited Washington, have taken away an impression something like this: emotionally as well as intellectually, they have become aware that the conferences and the meetings and the various discussions either in the open or behind closed doors, on the record or off the record, here and in other parts of the world, have set in motion currents and influences and pressures which have some of the cosmic force of the earthquake. We know an earthquake happens after the pressures become so irresistible that something inside the Earth must move. The politics of the world have apparently just about reached a similar state. It is the opinion here, in some quarters concerned with international relations, and with national defense, that we are confronting an international political earthquake. This does not necessarily mean immediate war, but it does mean turmoil, uncertainty, confusion, shocks, and great danger to the structure of civilization.

The French Attitude

People here see it this way, to be quite specific: we are entering the phase when France must declare itself. France is to some extent the pivot of Europe. It is not glowingly enthusiastic about us, at this moment. It did not go more sharply Communistic at the recent election. But the victory of the DeGaulleists does not imply any increase in pro-American sentiment. It likes us when we open the money-spigot. England apparently is the same old realist and frankly says that if it comes to a showdown it could not survive a day if it opposed the Soviets. Italy will be our friend so long as we keep up the supply of handouts. The rest of the story is about the same. The many and various pressures typified by this rough outline, as well as many others too complicated to enumerate, were expected to produce a climax on or about October 28. Like all similar anticipations of this nature the date is not to be deemed to be arbitrary but should be regarded as relative. The thought seems to be that around this time the conditions will more sharply outline the differences that stem from the ideologies and the objectives of the American philosophy, and the philosophy of the Russians. Apparently there is the thought that something like a crisis may be expected between the end of October and the end of November. It is scarcely expected that the crisis means war, but it is feared that a tension of this kind, with the absolutely unpredictable effects of its psychological factors, may cause explosions of tempers that can produce incidents which might throw the world into flame. There is no remote doubt that we are moving to a period of much greater strain. Our military friends very sincerely feel that the interval may arouse our own people to a consciousness of the situation to such an extent that they will demand the urgency and the insecurity be resolved by the declaration of a State of Emergency.

What is a State of Emergency? By and large, it will enable the Government to implement its machinery with controls that will bring about a greater state of preparedness. In essence it would set up a form of benevolent dictatorship, for the duration of the Emer-

(Please turn to page 160)

NEWS SUMMARY OF THE MONTH

34th NWAH&ACA Convention

A "Fuel Forum," in which authoritative representatives of the coal, gas, oil, and liquified petroleum gas industries will discuss the nation's fuel problem, promises to highlight the coming 34th Annual Convention of the National Warm Air Heating and Air Conditioning Association, December 4 and 5, 1947, Hotel Cleveland, Cleveland, Ohio. A full morning has been assigned for fuel discussions.



Members of the panel for the 'Fuel Forum': Robert Gray, Fueloil & Oil Heat, J. N. Stewart, National Coal Association and Howard D. White, Liquified Petroleum Gas Association.

In announcing the program, President Frank E. Mehrings declared that the Program Committee has gone overboard in arranging one of the best, if not the best, programs that the association has ever presented. Timely and informative subjects, vitally important to the warm air industry, have been packed into a 2-day program with adjournment scheduled in time to permit leaving late Friday afternoon.

The complete convention program is published in **ASSOCIATION ACTIVITIES** in this issue.

Housing Research

A VARIETY of home research projects, from coalbin to roof, will be carried on with a new house being built at the Small Home Research Center of the University of Illinois. It will be completed by November 1, according to Prof. William H. Scheick, co-ordinator of the Small Homes Council.

The basement of the house will be used in a project involving arrangements for use of solid fuels. This includes location and size of the fuel bin, ash handling, and other items connected with furnace operation.

It is the second research house at the Home Research Center of the University. The first is devoted entirely to the study of warm air heating. Two more buildings, one for a floor-slab research project and the other a research office, are under construction.

July Oil Burner Shipments

FACTORY shipments of oil burners in July this year totaled 100,524 units, according to a Bureau of Census report. This compares with 105,257 units

shipped in June 1947, and 46,481 units in July 1946.

Residential oil burners accounted for 96,760 of the July shipments this year.

Manufacturers' stocks increased from 18,924 oil burners at the beginning of the month to 22,657 at the end of the month. Unfilled orders at the end of the month totaled 705,754 units.

4th Quarter Steel Export Quotas

EXPORT quotas of steel mill products to be licensed during the fourth quarter have been announced by the Department of Commerce.

Steel requirements for special projects abroad, "of vital interest to the United States," are included for the first time.

Export quotas for 29 steel commodities are listed in the announcement, among which are the following:

Item	Tons
Iron and Steel Sheets, Galvanized.....	20,000
Iron and Steel Sheets, Black.....	90,000
Iron and Steel Strip, Cold Rolled.....	7,500
Terne Plate, Including Long Ternes.....	2,000
Casing and Oil Line Pipe, Seamless.....	40,000
Casing and Oil Line Pipe, Welded.....	50,000

Manual No. 9 Available

THE National Warm Air Heating and Air Conditioning Association announces the class room edition of Manual No. 9 is now ready for distribution. The manual is a technical code for designing warm air heating systems for buildings of more than 120,000 Btu.h loss.

Five design procedure sections and eight tables constitute the manual. Three job work sheets, Form 9A-47 (Heat Loss Calculations), Form 9B-47 (Warm Air and Return Air Branch, Stack and Register Sizing), and Form 9C-47 (Trunk Duct Sizing), are required for calculations and notations of sizing for each system designed.

Copies of both Manual No. 9 (Price 50 cents) and the work sheets (price \$2.50 for 50) may be obtained from the association's headquarters, 145 Public Square, Cleveland 14, Ohio.

August Furnace Shipments

FACTORY shipments of warm air furnaces in August totaled 80,899 units valued at \$13.6 million, according to the Bureau of the Census, Department of Commerce. These shipments represented a peak for the year and an increase of more than 40 per cent over the 56,498 units shipped in July. August shipments were also 30 per cent higher than the 62,246 units shipped in August of last year. Three fourths of all furnaces shipped in August were made of steel; the remaining were cast iron.

Solid fuel furnaces represented 43 per cent of the total shipments; oil-fired, 40 per cent and gas-fired, 17 per cent.

Let the Postman Ring Your Sales Bell

By David Markstein
New Orleans, La.

One of the most valuable methods of increasing sales has always been direct mail. Probably more interest is aroused in the recipient of a sales letter than is induced by any other form of advertising. In this article a man noted in the field of sales techniques tells you how to make direct mail pay off in increasing sales volume.

RECENTLY, the citizens of a mid-western city received an unusual letter sent by one of the city's heating contractors. It was die-cut into the shape of a fish. In snappy and not-too-long copy, the letter explained that the company was fishing for sales.

Prior to this, the same mailing list had received another unusual letter. It had a cigarette attached with scotch tape. The opening paragraph invited the reader to sit down, light up the cigarette and relax—while he read of an unusual offer.

The heating contractor who sent out these two letters has also mailed many other unusual ones. Each letter he uses is *different*—and brings astounding results. The reason for the company's fast growth, the manager believes, lies in just such highly unusual advertising. The fact is, that sales letters which are different—but not corny or merely slap-happy—bring results. Big results.

Will Letters Sell Heating Systems?

How can such mailings be tied to the promotion of the average heating and air conditioning business? How can they be packed with plenty of solid *sell* in addition to unusualness? Let's look at how the *different* sales letters bring results.

There are roughly three ways in which inexpensive sales letters can be packed with attention value.

They can be made to look different.

They can be made to read differently.

They can sport inclosures that grab at the reader's attention like a trout rising to a good lure.

The cigarette letters mentioned above fall into the third classification. While these are more expensive to produce than the other two kinds, in both cash outlay and trouble, they almost never fail as sales bringer-inners. That is, unless—again, they have been corned up.

The inclosure sent with such a letter to attract attention might be anything. Almost any object suitable for inclosing with a sales letter can be tied, by skillful writing, to heating and air conditioning installation sales. Here are some examples of how everyday objects can be made into attention grabbers:

Inclose an ordinary straight pin. Explain that pin money was once literally for spending on pins because pins were expensive. But today, pins cost a mere pit-

tance, and pin money has come to mean small sums that can be comfortably spent without being missed. For example, for pin money, you can have a home or office air conditioned. The letter would then go on to explain sales pointers, concluding with another reference to the pin money price and an action "hook" to induce the reader to do something about your offer.

Inclose a cigarette as did the mid-western contractor. Invite the reader to enjoy a good smoke—now. While he is doing so, he can read the short message you have for him. The message that follows will be straight selling.

Have a Card!

Buy a few decks of playing cards, turn down the corner of each card, and use the cards you have thus "marked" as inclosures. Ask whether the reader is buying with the cards marked against him. Explain that this happens when his dollar does not buy a dollar's worth of satisfaction and value, which occurs almost any way he spends it at today's high prices. But there is one purchase that always brings many times its price in solid satisfaction—*Indoor Comfort*. From there, straight selling talk should bring in the dollars.

Inclose an inch of cut-off tape measure. Explain that it is for measuring the satisfaction that today's inflated dollar buys. As with the playing card, tell how one of the greatest sources of satisfaction through the years to come is year-round comfort.

The list of inclosure possibilities, and the ways in which they can be used by the contractor, is endless. A little ingenuity and the use of ordinary, easy-to-procure articles can give your sales letters a selling and attention punch many times better than an ordinary letter.

There are other ways in which to do the same job which are, sometimes, less expensive and easier to produce. One is to make your letters *look* different.

Some companies have done this by having their letters die-cut—as did the heating contractor whose letter explaining that he was "fishing for orders" was cut into the shape of a fish.

While excellent sales builders, letters like these are relatively expensive, since they call for having special

(Please turn to page 162)

WAGE INCENTIVE PLANS

Types of Wage Incentive Payments

SOUND incentive plans, as established by the original pioneers in this work and as carried on by accredited industrial engineers, have been based on a solid engineering foundation. Such plans involve study of the best management practices and require the expenditure of a considerable amount of time.

Considering whole regional areas and including all types of plans—good, bad, and indifferent—a study of 514 plans indicates that they averaged an increase in productive performance of about 40 per cent. Ninety-five per cent of the plans gained more than 5 per cent and some ran from 100 per cent to 150 per cent in specific installations.

Wage incentive plans applying to individual workers and based upon time study can result in increases in productivity averaging more than 60 per cent. In contrast, all other types of plans, including those based on past performance and those applying to departments and whole plants, often average increases of less than 30 per cent.

In establishing wage incentive plans, two things are considered: First, the method of determining the base, or standard, or 100 per cent productivity and, second, the amount of payment which will be made for productivity below, at, and above the base.

The base has sometimes been established by guess, sometimes from past records of performance, and sometimes by carefully worked out time studies backed up by fundamental research into methods, material, and equipment. Whatever the means of setting up the base production, it is an important factor in determining the type of incentive which may be chosen.

Payments Vary

Wage payments may vary from ordinary day work to straight piece work. In the first instance, it is the employer who is chiefly affected by the gains or losses, and in the second, it is the employee. Between these extremes there have been many plans whereby the employer and employee share the gains and losses.

In earlier days, the employee was entirely unprotected on straight piece work when conditions were bad. Since the advent of the Fair Labor Standards Act, there has been a guaranteed wage below which no employee's pay may go.

Ordinarily the payment of incentive wages begins at the accomplishment of the base or 100-per cent production. Sometimes, however, in order to secure an early accomplishment, payment may begin at a point of less production. Many times, also, the rate of pay-

ment is not in direct proportion to the rate of increase in production; in some cases, management may prefer straight day work, in some cases, straight piece work or proportionate pay. At times, labor prefers day work and, at times, straight piece work. There may be circumstances in which, for local reasons, both parties may agree to a plan which is somewhere between these two extremes.

All available scientific and engineering ability should be used, combined with a sympathetic attitude toward the human relations involved.

Incentive Wages for Indirect Workers

Wage incentives for either direct or indirect workers should provide increased wages to workers for effort in excess of the normal effort which corresponds to pay by the hour. There has recently been an increasing demand on the part of labor for incentive payment for indirect workers. This has been so because often workers on direct production jobs for which little training is needed are, by the addition of substantial incentive earnings, receiving more total wages than skilled indirect workers.

The direct workers are receiving the extra money only because of more than normal skill and effort, and care should be taken not to destroy the effect of the incentive plan by simply paying more money to nonincentive workers without regard to their increased skill and effort.

The wisest course for the manufacturer in meeting this demand is to determine the specific functions of indirect workers and the time allowances necessary for their performance. This can sometimes be done as readily as in the case of direct workers and many times with more pronounced effect.

However, if the exigencies of the situation demand that some form of incentive payment be applied to indirect workers as a whole, or in groups, then the best possible measures of their effort should be sought. As in the case of plant-wide incentives for all employees, a broad measure will not accurately gage all indirect workers. Certain circumstances may require more work from some indirect workers even though the total productive effort of the plant or a group may decrease.

Where a company manufactures just one item or a very few items, the total effort may be measured in units of production per indirect man-hour. This is seldom the case.

Therefore, our attention is turned to some measure in terms of the effort of the direct workers. Some companies have been tempted to pay the indirect

Reprinted from WPB "Handbook of Wage Incentive Plans."

workers a bonus depending only upon the production per man-hour, or efficiency of the direct workers. This involves fallacious reasoning.

Merely to pay all or a portion of the indirect workers a bonus equivalent to bonus earned by a group of direct workers without any measure of the productivity of the indirect workers is not only an uncontrolled increase of pay but tends to destroy the value of the direct workers' incentive.

It is not necessarily true that the productivity or efficiency of the indirect workers increases as that of the direct workers increases for two reasons:

1. The work done or total productive output of a plant or department not only depends on the average productivity of the direct workers, but also on the number of such workers—really on the total direct standard or "time-allowed" hours.
2. The efficiency of the indirect workers depends not only on their total effort, however measured, but also on their "time-taken" hours.

High efficiency of the direct workers with fewer direct worker hours might mean less total work, and vice versa. Also, an increased number of indirect worker hours with the same total plant production would mean less indirect worker efficiency and vice versa.

However, when production standards are established for a large portion of the direct operations, the total of the standard hours, or "time-allowed" hours of the operators is the best measure of the total productive effort of the direct workers. It may also be the best available measure of the total effort of the indirect workers. In cases where some of the productive operations are not on an incentive basis, standards for these operations are sometimes estimated to complete the picture.

Figuring Indirect Hours

It is, of course, a simple matter to determine the total number of hours taken by the indirect workers in a designated period of time. Therefore, when there is no opportunity to set up properly engineered standards for indirect jobs and expediency demands a solution, an analysis of past relationship between direct "time-allowed" hours and the corresponding indirect hours, adjusted by the most logical estimates possible, may be made, and a standard may be established showing a normal ratio of direct "time-allowed" hours to indirect "time-taken" hours. For example, an analysis might show this ratio to be based on 10,000 direct "time-allowed" hours and 5,000 indirect "time-taken" hours.

$$\text{or ratio} = \frac{10000}{5000} = 2.00$$

Then, if the incentive is effective, this ratio should increase at future periods, either by an increase in the numerator, representing total direct effort, or a decrease in the denominator, representing indirect man-hours. The incentive may be arranged to pay the indirect workers a percentage increase in earnings over base rate equal to some portion of the percentage increase above the standard ratio.

Obviously, in considering the above method, if there are significant changes in types of products, operations, methods, materials or equipment, the necessary

studies and adjustments should be made for both direct and indirect jobs. It may also occur that entirely new indirect functions and even groups may be added. Old functions may be eliminated. In such cases great care must necessarily be used to add or subtract the proper number of "time-taken" indirect hours.

Moreover, it should be understood that, in most instances, one standard ratio of direct hours to indirect hours does not literally apply to different rates of plant activity. A certain number of indirect workers, such as watchmen, janitors, storekeepers, etc., must be retained even as the plant activity approaches zero.

Plant activity is measured in various ways. Some of these are by: 1. *Used Machine Hours*. 2. *Weighted Units of Production*. 3. *Sales Value of Production*. 4. *Direct Standard "Time-Allowed" Hours*. 5. *Direct Standard Labor Cost*.

The functional relationship between direct and indirect hours and plant activity will vary with different companies. Often there is considered to be a straight line relationship as can be visualized this way.

Let x =the plant activity as a percentage of 100 per cent normal activity, measured in the most practicable units.

Let y_d =any point on a line MN showing direct standard "time-allowed" hours.

Let y_i =any point on a line RS showing corresponding indirect hours.

Let R =the ratio $\frac{y_d}{y_i}$

Let A =the distance MR which is the absolute number of indirect hours at zero plant activity.

Let K =a constant equal to the direct "time-allowed" hours equivalent to an increase of 1 per cent of plant capacity.

Let C =a constant equal to the indirect hours equivalent to an increase of 1 per cent of plant capacity.

$$\text{Then } y_d = Kx$$

$$\text{and } y_i = A + Cx$$

$$\text{and } R = \frac{y_d}{y_i} = \frac{Kx}{A + Cx}$$

If, in a particular unit, we assume the following conditions:

$$A=1000 \quad K=100 \quad C=40$$

Then, when,

$$x=0, R = \frac{100 \times 0}{1000 + (40 \times 0)} = 0.00$$

$$x=25, R = \frac{100 \times 25}{1000 + (40 \times 25)} = 1.25$$

$$x=50, R = \frac{100 \times 50}{1000 + (40 \times 50)} = 1.67$$

$$x=75, R = \frac{100 \times 75}{1000 + (40 \times 75)} = 1.88$$

$$x=100, R = \frac{100 \times 100}{1000 + (40 \times 100)} = 2.00$$

$$x=125, R = \frac{100 \times 125}{1000 + (40 \times 125)} = 2.08$$

Thus, either mathematically or by use of a chart, a table, as shown below, may be constructed showing,

for any percentage of plant activity, a standard ratio of standard direct "time-allowed" hours to the corresponding indirect hours.

Plant activity (per cent)	Standard hours		Ratio direct to indirect
	Direct	Indirect	
0.....	0	1,000	0
25.....	2,500	2,000	1.25
50.....	5,000	3,000	1.67
75.....	7,500	4,000	1.88
100.....	10,000	5,000	2.00
125.....	12,500	6,000	2.08

In the above case, at 100 per cent activity, this ratio is 2.00. Now, if, in any particular incentive period when the activity is 100 per cent with total direct "time-allowed" hours of 10,000 and the indirect "time-taken" hours have been reduced to 4,000 from 5,000, then the ratio of the direct "time-allowed" hours to the indirect "time-taken" hours is:

$$\frac{10000}{4000} = 2.50.$$

Thus, the standard ratio of 2.00 may be considered as the standard productivity or production per man-hour of the indirect workers, and the actual ratio of 2.50 may be considered their actual productivity. In this example, the gain in productivity over standard is:

$$\frac{2.50 - 2.00}{2.00} = 25.0\%$$

A bonus payment to indirect workers for this increased productivity may, of course, be made in ac-

cordance with a wage incentive plan which is felt best suited to the conditions. Ordinarily, in such an approximate plan, where no studies have been made on an individual basis to determine the necessary work involved, it is generally agreed to be advisable and appropriate to pay as bonus a percentage of hourly rate not greater than one-half of the percentage increase in productivity.

Obviously, if the plant activity should fall to 75 per cent, the standard ratio of the direct "time-allowed" hours to the corresponding indirect hours would drop from 2.00 to 1.88. If, with this activity, there are, in an incentive period, a total of 7,500 direct "time-allowed" hours and a total of 3,250 indirect "time-taken" hours, then the actual ratio or productivity would be

$$\frac{7500}{3250} = 2.31 \text{ against the standard ratio of 1.88.}$$

The gain in productivity for the indirect workers would figure

$$\frac{2.31 - 1.88}{1.88} = 22.9\%$$

In conclusion, it should be emphasized that, although expediency may demand such a solution as described, the soundest and fairest practice calls for a detailed study of individual indirect jobs with remuneration a function of the effort expended.

Therefore, such an expediency should be carefully planned so that it may be temporary and readily convertible to a properly engineered plan when time and conditions permit.



Have You a Picture Like This?

AMERICAN ARTISAN is seeking interesting and unusual pictures, typical of the fields served by this publication, for use on the front cover.

Our particular need is for pictures of warm air heating and residential air conditioning installations that will serve to publicize the quality of work being done by our industry. Such photos will bring the reader \$5.00 on acceptance.

Judgment will be on a basis of content, clarity, composition and general interest to our readers. For reproduction purposes 8 x 10 glossy prints are preferred and photos not used will be returned.

Address —

The Editors
American Artisan
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Chicago 2, Ill.

BANK CREDIT IS BEING MODERNIZED

By Arthur Roberts
Pompton Lakes, N. J.

SINCE the 1930's, the average dealer or contractor has found it hard to get bank credit. We recall talking to a warm air dealer around 1932 who owned a valuable piece of business property on the main street opposite a bank, had a substantial stock, a good reputation, business ability and long residence in the town, yet, he couldn't borrow \$500 from his bank to discount his bills. This case is typical of how banks tightened up in the early 1930's and this had much to do with prolonging the depression and the government eventually taking over to prime the pump. The banks should have done this priming but bankers in the past have operated too much on a heads-I-win, tails-you-lose basis. The function of true banking is to supply funds for legitimate enterprises in good times and bad. When it doesn't do that, the banking system fails in its economic duty.

About the same period, we were auditing the books of a warm air dealer in a different state when a man walked in for certain heating accessories. The dealer was out of stock because his credit had gone sour with suppliers, yet the business had been a successful one for years and the local banker had been in the store only a few days before bragging that his bank vaults were full of money. Here was idle money loafing in a banker's vault which a warm air dealer could have used to buy heating accessories from a manufacturer so that he could hire unemployed workers and a customer willing and able to buy, but the circuit was kept open because a banker kept his money locked up in a vault.

In the 1920's, many retailers could get credit just on their own signature, often substantial sums, then almost overnight the banks shut off the flow to almost all retailers except the chains and they could borrow at 3 per cent. Obviously, business dried up.

Change in Attitude

We give you these flash-backs to high-light the contrast between the attitude of bankers then and now, a transformation that most members of this industry do not yet realize. Through the medium of the Post-war Small Business Commission of the American Bankers Association, postwar loans to small businessmen are being promoted with a verve typical of commodity advertisers, so the dealer or contractor who contemplates modernization, expansion or promotion had better line up his plans now, estimate the cost and see his banker because he isn't likely to be as crusty as he has been since the early 1930's. Here are some facts about modernized bank credit that should

help you appraise your requirements intelligently and make the proper contacts with a banker.

Bank loans are secured by collateral or unsecured. Charges are usually lower on collateral loans. The character loan is unsecured and based upon the general integrity and earning capacity of the businessman. This is the type loan most desired by retailers or contractors. To get one, a profit and loss statement and balance sheet are needed plus a good accounting system.

Too many smaller businessmen are afraid to borrow under any circumstances. Stingy credit practises are as bad as slim stocks or sub-normal advertising. Big business uses plenty of fixed capital and operating money and is quick to borrow if it can employ the funds profitably. If you can increase efficiency and cut costs by the use of additional money, if you can build volume, thereby increasing profits more than the money will cost you, then you can use more bank credit. The real yardstick is whether you can put the money to profitable use, make it earn more than you pay for it. If you can't, it doesn't pay to borrow, even at 3 per cent. It isn't wise to use too much of your personal funds for business purposes.

Types of Loans

The short-term loan runs for a year or less, the long-term loan for more than a year, the former providing working capital, the latter the funds for capital goods, such as fixtures, equipment, store fronts, servicing tools and business property. Do not use short-term money to invest in fixed or capital goods. If you renew short-term loans continually, it may indicate that you are considering them on a long-term basis, which the banker doesn't like. A banker may arrange a short-term loan as needed, but it is better to ask for a line of credit, an advance commitment to lend money up to a certain maximum, usually on a revolving basis, so that you may have more than one loan out at a time, providing you keep within the maximum agreed. Keep a line of credit working. If it lies idle, the banker may cancel the arrangement.

Term loans, long-term accommodations, average time 5 years, frequently unsecured at low interest rates, payment usually out of earnings, have been granted to few small businessmen up to now. The American Bankers Association now states that approximately 12,000 to 15,000 banks are preparing to make term loans to small retail businessmen, including warm air heating dealers and sheet metal contractors. A term loan may be used to stabilize the financial set-up over

a period of years, giving the borrower the opportunity to plan on a long-term basis. Big concerns, with access to term loans, plan their credit requirements a number of years in advance, which, heretofore, afforded them an advantage over smaller businessmen. Now that the term loan is available to all retailers who qualify, the smaller borrower is in a better position to minimize the peaks and valleys in operation. The curtailment of working capital or fixed capital has prevented many retailers from straddling depression periods satisfactorily or from acquiring ample funds to promote expansion in good times. The availability of bank loans for such purposes now assures greater stability and larger profits for the small businessman.

Length of Terms

Some banks offer installment loans for a year or less, from \$100 to \$3,000, repaid monthly in installments. You may get a lower rate with collateral, but, if possible, do not have your wife sign a note or offer your home or life insurance as collateral. The rate varies from 7 to 20 per cent, is relatively high and varies with different banks.

Banks make loans on accounts receivable, notes receivable and installment accounts, either on a notification or non-notification basis. In the former case, the bank notifies the debtors and collects. In the latter case, the bank does not notify the debtors, you collect. The rate on non-notification paper is higher. However, some states require notification.

Bank loans secured by a lien on new or used equipment bought by you may run 3 years or longer. Compare the cost with the rates given by equipment manufacturers and distributors for financing the purchase. It may pay to borrow from the bank instead of buying on time. Chattel mortgages are like equipment loans, except in the transfer of title, and are on property already bought and paid for. Moreover, the money borrowed may be used for a different purpose entirely. The property under chattel must be removable so that it can be attached if the loan is defaulted.

National banks make first mortgage loans on improved business property, state banks under state statutes, also savings banks, trust companies and insurance companies. Banks also lend money on life insurance policies at as low as 3 per cent interest but you may be asked to get a co-signer and you must have a cash equity in the policy to cover.

A veteran is eligible for business loans under the Serviceman's Readjustment Act for an existing business or new venture, but before proceeding, consult a veteran counseling organization. Under FHA, the small businessman can get loans for the construction

of new small commercial buildings or their modernization and the repair of old buildings. Loans cannot be for machinery or equipment. Maximum size of loans, \$3,000, maximum term, 3 years, the per annum interest rate is about 9.7 per cent.

Some banks lend money on warehouse stocks or goods put in a warehouse, using as security a receipt issued by the warehouse, and sometimes businessmen store their goods on their own premises, called a "field warehouse," which is given to the custody of a commercial warehouse and a warehouse receipt, occasionally called a trust receipt, issued as security for the loan. The average retailer isn't likely to have use for such a loan but he may want a loan on his inventory and he can get this much easier today than in prewar years because this is one of the type loans that banks are promoting among smaller businessmen.

Bankers Still Watch Their Dollars

Bankers are not "do-gooders" at heart. Their change of face toward the small businessman is not altruistic but in self-interest. Big companies, when they borrow at all, pay low interest rates, often one third the rate paid by the smaller borrower. The government is forcing down interest rates to keep down bond interest expense. About 45 credit agencies of the United States government are in competition with the banking system and were lending as of September 30, 1945, over 5 billion dollars. Obviously, this is cutting bank revenue and explains why banks are aggressively going after other forms of lending, from accounts receivable loans to term loans for small businessmen. Some banks are offering mortgage money at less than 4 per cent, many big companies are calling in their loans or paying off bonds, further reasons why banks must look elsewhere for revenue; and incidentally, if a businessman has a mortgage on his property at present and is paying around 6 per cent annually, he may be able to re-finance it at a lower rate.

In the aggregate, the small businessman offers a bigger field for revenue than the comparatively few big fellows, he offers bankers much greater profit possibilities because there are so many more of him and now that the American Bankers Association is out gunning for the retailer's business, including those doing contracting work, he who needs funds for post-war promotion or expansion should find it advantageous to contact his banker now and talk matters over with him. Even if you were turned down in the past, as has happened to many good businessmen, your chances are much brighter today to get a bank loan to fit your needs.

8th International Exposition

THE American Society of Heating and Ventilating Engineers, sponsor of the 8th International Heating and Ventilating Exposition, is inviting other societies and their members to attend its annual meeting, coincident with the exposition, which will be held in Grand Central Palace, New York, February 2 to 6, 1948.

Every requirement in the heating, ventilating, and air conditioning of institutions, industrial plants, and

homes will be represented in the list of exhibits, now numbering nearly 300.

Sources of heat will include coal, oil, and gas. Methods of distribution including gravity and forced air circulation, steam, water, and electricity will be covered in a variety of ways. Ventilation will range from the most elementary fans to the most comprehensive air conditioning systems.



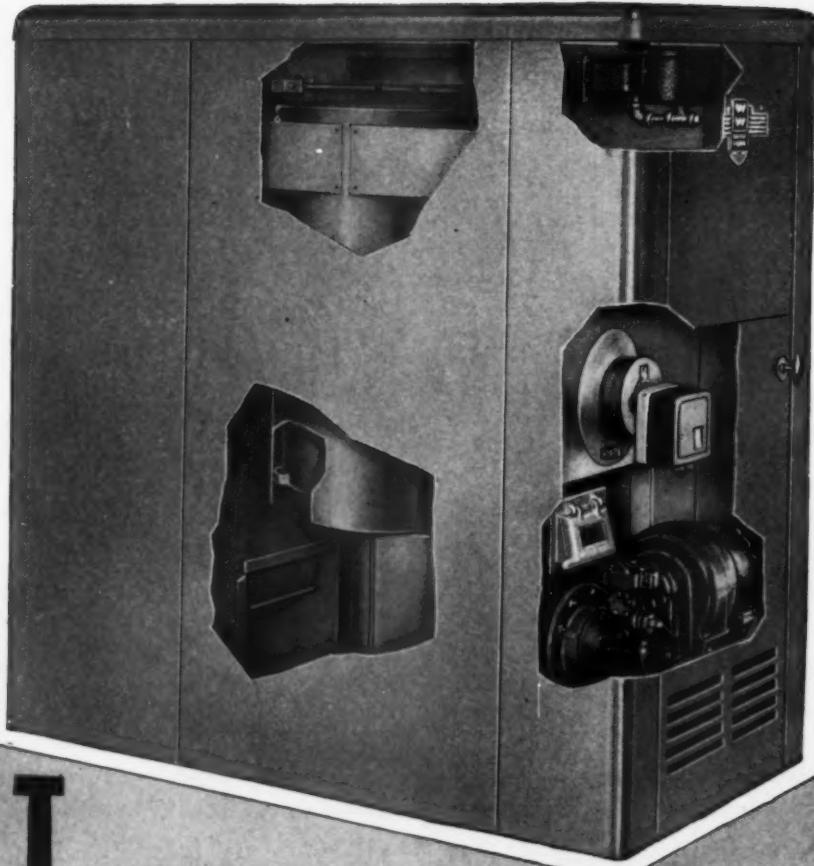
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FIVE CHECKS FOR COMFORT DIVIDENDS

By S. Konzo*

- ✓ *Adjusting the Fuel Input*
- ✓ *Adjusting the Blower*
- ✓ *Adjusting the Blower Switch*
- ✓ *Balancing the Air Distribution*
- ✓ *Setting the Room Thermostat*

Continuous air circulation has come to be recognized as the most effective answer to some of the discomforts that may exist in the Winter Air Conditioning system that is not correctly adjusted. The *Indoor Comfort Conferences* of the National Warm Air Heating and Air Conditioning Association have advocated continuous air circulation as a goal to be sought after and in this article Professor Konzo gives complete information on the steps to be taken. Due to the timeliness and value to the dealer of this article, we are deviating from usual procedure by presenting it complete in this issue.

LOOKING at the progress in warm-air heating from the vantage point of some 15 years of past history is in many ways similar to the experience of a hiker who stands on a hill and looks over the valley that lies behind him. He sees little knolls, obstacles, and winding paths that had to be surmounted before he reached a position where he could survey the whole tortuous and rugged road.

Let us go back to the late 'twenties and the early 'thirties. First attempts at extending the gravity heating system were in progress. These early pioneers in winter air conditioning based their reasoning on the argument that gravity circulation of warm air was a good thing but that nature needed an assist, and that a booster fan would promote a more positive air circulation to all the rooms in a house and that leader pipes longer than about 12 feet could be made positively effective. In these early developments it was found that a booster propeller fan placed in the shoe of the return duct would churn the air, but a substantial portion of the air was not effectively utilized unless bypass louvers were placed around the propeller fan. Later, it was found that the air space between the furnace and the casing was so large that the return air passed thru the casing of the furnace without becoming heated. This condition brought out a rash of baffle designs that narrowed the casing space, and later led to tighter casings. In turn, these narrower air passages built up resistance, and so also did the use of smaller sized ducts.

Hence, in the middle 'thirties the propeller or booster fans were replaced almost entirely by centrifugal fans, or furnace blowers. From the standpoint of equipment design, real and accelerated progress began at this

point. This progress was largely confined to the manufacturer of the equipment, for in the installation field many ideas from gravity heating and gravity-booster practice hung on tenaciously.

In gravity warm air heating practice, for example, many heating contractors had arrived at the conclusion that if the system was sluggish in operation, the air circulation could be aided by increasing the firing rate of the furnace and getting hotter air to flow. When booster fans came into being, the plants were essentially gravity plants and the use of the fan did increase the air flow, but only by a small percentage. The noise of the fans, together with the fear that electrical operating costs would be excessive with long operation resulted in the prevailing practice of operating such fans intermittently. This intermittent operation used the "shot-in-the-arm" technique, or "give-it-the-gun and let'er-coast." The operating temperatures at the bonnet and register were ordinarily not much different from those commonly experienced in straight gravity plants.

It is little wonder, therefore, that in the last decade when winter air conditioning and forced-air heating systems have been installed by the thousands, that a carry-over practice has prevailed.

The Difficulties Encountered with Intermittent Operation

Altogether too many forced-air systems have been installed in which "booster-gravity" methods of plant operation have been used. (See Fig. 1.) A listing of some of the often-voiced difficulties reveals a consistent pattern. If the following lists of difficulties still plague the contractor, it is time that he change his practice:

- a) The room feels hot one moment and cold later.
The room is comfortable after the blower has

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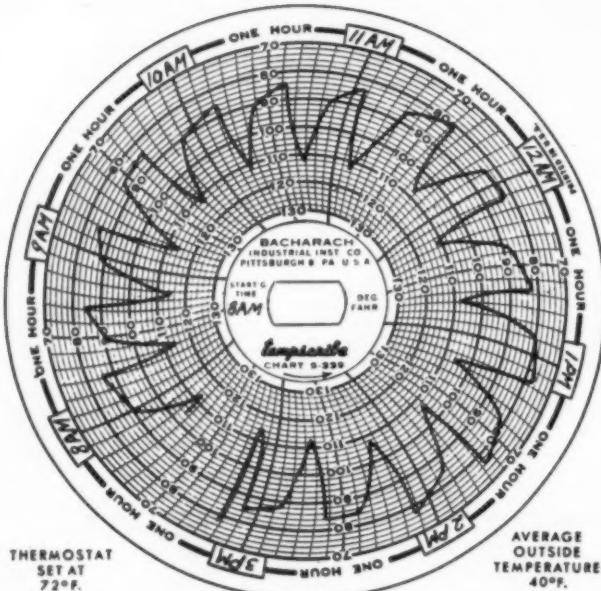


Fig. 1—Intermittent blower operation causes up-and-down variations in register temperature. This condition can be corrected. (Charts and diagrams supplied by courtesy of Bacharach Industrial Instrument Co.)

been operating a few minutes, but becomes unsatisfactory a few minutes after the blower shuts off.

- b) The thermometer at the thermostat seems to be indicating about 70 deg. but the room is uncomfortable just before the blower starts operating.
- c) The bedrooms on the second story always seem to be getting heat, but, when the blower stops operating, the room over the garage and the sun room at the far end of the first story seem to cool more rapidly than the rest of the house.
- d) There is a noticeable draft in front of some of the registers at the beginning of each blower operation.
- e) There is a noticeable and excessive air motion in many parts of the living room.
- f) It is hard to heat the basement rooms in mild weather.
- g) The intermittent operation of the blower is noticeably noisy.

These and similar complaints have been received by many heating contractors, and the process of correcting the difficulties has, in many cases, not given much improvement when such corrective measures consisted of: a) speeding up the blower and b) increasing the cut-in setting of the blower switch.

THE RECOMMENDED METHOD OF ADJUSTMENT

A careful study of the seven preceding "complaints" reveals two common denominators: 1) lack of continuous air circulation and 2) noticeable air motion. The recommended method of adjustment deals directly with these two factors. If a forced-air heating plant can be adjusted so that a moderate quantity of air at relatively low temperature can be made to circulate almost continuously in average heating weather, the seven "complaints" would largely vanish. (See Fig. 2.)

- a) Continuous delivery of heat will remove "jerky" on-and-off heating effects.

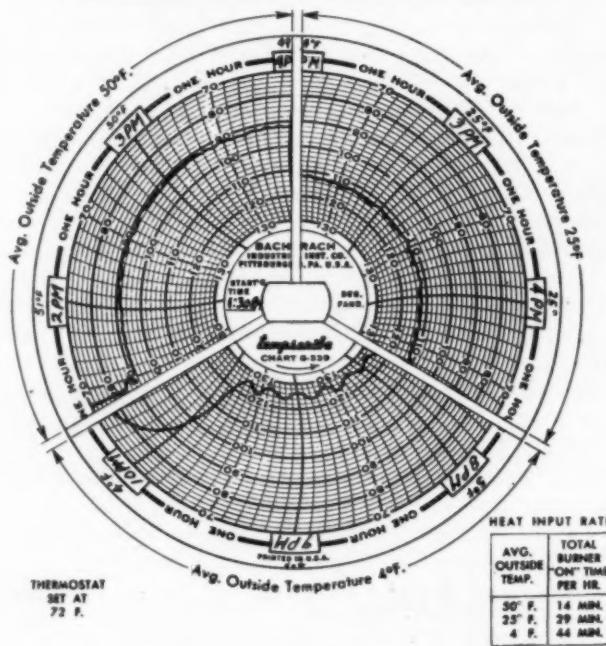
- b) Temperature variations in the room will be slow and not noticeable.
- c) The duct system was designed for continuous air circulation and not for "booster-gravity" flow. The latter operation makes the balancing of heat distribution between rooms extremely difficult.
- d) and e) A moderate quantity of air properly distributed into the room instead of a concentrated blast of air will overcome objections due to excessive air motion.
- f) Basement rooms cool at far different rates than rooms upstairs. At best they are difficult to maintain at a constant temperature when the controlling room thermostat is located upstairs. Continuous heat delivery will, however, ordinarily give reasonably satisfactory results.
- g) Relatively slow speed operation of the blower not only is quieter, but uses less electrical current and produces less wear on the moving parts than a high speed blower which is slammed on and off.

THE FIVE CHECKS FOR COMFORT DIVIDEND

This matter of proper adjustment of the forced-air heating plant is of such vital concern to the manufacturing members of the National Warm Air Heating and Air Conditioning Association that a nationwide educational campaign has been started. Those who have attended the two-day classes being conducted by Mr. Guy Voorhees in various cities in the country have seen the short sound-slide films dealing with the subject.

This present article is an amplification of the same story; a story which will have to be carried into every section of the country, and which will have to be repeated over and over until every heating contractor will understand not only what is to be done, but how and why.

Fig. 2—Operating the blower according to the principles advocated by the National Warm Air Heating and Air Conditioning Association varies the register air temperature with the weather and eliminates the up-and-down variations. Compare with Fig. 1.



Briefly stated, the five steps consist of:

- a) Adjusting the fuel input.
- b) Adjusting the blower.
- c) Adjusting the blower switch.
- d) Balancing the air distribution.
- e) Setting the room thermostat.

Each and every step is an adjustment on the plant after it has been installed. It is true that a good furnace and blower, a well installed duct system, and proper types of registers are important. In the final analysis, however, the critical part of each new installation consists in the service provided only by the heating contractor in "tuning up" the entire installation.

✓ ADJUSTING THE FUEL INPUT

Setting the fuel input for continuous blower operation often means reducing the input so that automatic burners will either:

- a) operate over longer periods, or
- b) cycle more frequently.

In either case the result is the same, and that is to provide heat to the building at a more uniform rate that will nearly balance the heat loss rate of the structure. Theoretically, the burner input rate is set just high enough so that by operating the burner continuously in coldest weather, the structure will be heated. Actually, a slight margin of safety, or reserve capacity, is usually provided so that in coldest weather the burner will operate from 80 to 90 per cent of the total time.

Fuel Input for Hand-Fired Coal Furnaces

Even under the best conditions of firing practice it will not be possible to control the heat output of a hand-fired furnace to the same degree of precision as an automatic burner. Nevertheless, under ideal conditions of hand firing, a coal furnace possesses one inherent advantage that is difficult to duplicate with a fixed input burner. A properly fired hand-fired furnace can be controlled so that the heat output can be modulated in accordance with heat demand. That is, the fire can be varied from say 15 to 25 per cent of its rated output to its maximum output. The fire is continuously maintained, but its intensity can be controlled. To a large extent, however, the success obtained in control of the fire is dependent upon the care taken by the home owner and upon the use of equipment which will provide draft controls. The following suggestions are offered:

- a) Ashpit doors and fire doors should close tightly. Unless off-period burning can be reduced to about 10% of the maximum rate, some overheating will occur.
- b) Draft dampers should be set to open not more than $\frac{1}{4}$ inch at full opening. The fire must not be allowed "to run away."
- c) Damper chains should operate smoothly so that draft dampers will not "stick."
- d) The use of a barometric type, draft regulating damper is highly recommended in any installation having a strong draft. Models are now available in which the barometric draft regulator can be connected to the damper motor. The barometric draft

regulator can be set to open whenever the smoke pipe draft exceeds about 0.06 to 0.08 in. By placing a limit on the draft, a ceiling will be placed on the combustion rate and the flue gas temperature.

- e) A limit control is also an essential safety control device which acts to close the draft dampers whenever the circulating air temperature exceeds a safe value. Ordinarily the limit control should be set at 200 deg. F, but a lower setting may be more desirable.
- f) The owner should be instructed not to set the room thermostat to its top dial reading when he desires a warmer room; and then to run the dial setting down to 60 deg., after he begins to cook. If adjustments are necessary, the room thermostat dials should be moved not more than 2 or 3 degrees at a time.
- g) The owner should be instructed in the proper firing methods. A roaring "runaway" fire should be avoided at all costs, since such fires will result in poor temperature control, poor fuel economy, damage to grates and furnace, and increased fire hazard.

Fuel Input for Stoker-Fired Coal Furnaces

Coal stokers are fixed input burners only insofar as feed rates are concerned. A 15-lb stoker, for example, will feed coal at a rate of 15 lb per hour, which is equivalent to a heat release of about $15 \times 12,000$ or 180,000 Btu per hr.

It is not too clearly understood by most heating men that the burning rate can be set over a fairly wide range, even for a fixed input rate. The burning rate during stoker operation is determined by the amount of air that is provided for combustion by the stoker fan. If too large a quantity of air is fed into the stoker retort, the coal will be burned as fast as it is fed into the retort. From a practical standpoint this maximum burning rate leads to undesirable operation since

- a) the active fuel bed becomes thin,
- b) a danger of burning the retort exists,
- c) a long torch-like flame is obtained which may produce hot spots in the furnace,
- d) high flue gas temperatures and low efficiencies may result, and
- e) excessive fly ash may be blown out of the fuel bed.

On the other hand, by feeding too small an air quantity:

- a) the fuel may pile up in the fuel bed,
- b) incomplete combustion may be obtained, and
- c) smoky operation may result, particularly during long stoker operations.

The happy medium which is sought is that air quantity which, during normal winter operation, results in a fuel bed thickness of from 6 to 8 in., a slightly yellow flame barely on the smoky side, and an active fuel bed that is larger in diameter than that of the retort. This air adjustment can be made only after the fuel bed has become established and after the stoker has been operating intermittently for some time.

The minimum feed rate for the stoker can be set as follows:

$$\frac{(\text{Btu per hr heat loss})}{1000} \times 0.15 = \text{feed rate, in lb per hr.}$$

For example, a house having a heat loss of 100,000 Btu per hr should have a feed rate of 100×0.15 or 15 lb per hr. In the case of a stoker, the feed rate does not have to be set exactly on the head. In the first place, most stokers do not have close adjustments of feed rates, and in the second place, a slightly larger feed rate can be readily handled by the air adjustment.

A properly adjusted stoker gives a high-low heat input. That is, during the off-period of the stoker some amount of burning takes place. The off-period burning tends to produce a more uniform heat delivery than the type of burning which results from burning the coal as fast as it is fed into the retort.

(Derivation of equation for stoker feed rate:

$$\text{Btu per hr heat loss} = \text{lb per hr} \times 12,000 \times 0.85 \times 0.65, \text{ or}$$

$$\text{lb per hr} = \frac{\text{Btu per hr}}{12,000 \times 0.85 \times 0.65}, \text{ or}$$

$$\text{lb per hr} = \frac{\text{Btu per hr}}{1000} \times \frac{1}{12 \times 0.85 \times 0.65}, \text{ or}$$

$$\text{lb per hr} = \frac{\text{Btu per hr}}{1000} \times 0.15.$$

The 12,000 refers to Btu per lb of coal; the 0.85 refers to duct transmission efficiency, and the 0.65 refers to bonnet efficiency.)

Fuel Input for Oil-Fired Furnaces

Many oil-fired furnaces, particularly those equipped with conversion burners, have excessively high rates of oil input. It is true that a high rate will give quick response to heat, but just as in the case of the hand-fired plant, high input rates result in low efficiencies, infrequent burner operation, and abuse to the furnace. During the past ten years, a gradual reduction in the minimum oil input rates has been made. The heating contractor should understand, however, that the minimum practical rate that can be obtained is dependent upon the type of burner. For example:

- High-pressure gun-type burners can be used with minimum rates of between 0.8 to 1.0 gallon per hr.
- Low-pressure gun-type burners and rotary-type can be adjusted to as low as about 0.5 to 0.75 gallons per hr.
- Vaporizing pot-type can be adjusted to flow rates even less than 0.5 gallons per hr.

In any case, once the oil input rate is fixed, the burners operate intermittently, and the finer adjustments of heat input are made by cycling the burner according to heating demand.

In general, the burners should operate at least three to four minutes during each on period. Shorter on-period operation may result in production of smoke and release of unburned gases until the firepot has attained its operating temperature.

The minimum oil feed rate for oil burners can be determined as follows:

$$\frac{(\text{Btu per hr heat loss})}{1000} \times 0.011 = \text{gallons per hr.}$$

For example, a home having 100,000 Btu per hr heat loss will require a minimum oil input of 1.1 gallons per

hr. For a high-pressure, gun-type burner a commercial nozzle that will give oil rates slightly greater than 1.1 gallons per hr may have to be used.

(Derivation of equation for oil input rate:

$$\text{Btu per hr heat loss} = \text{gal per hr} \times 140,000 \times 0.85 \times 0.75, \text{ or}$$

$$\text{gph} = \frac{\text{Btu per hr}}{1000} \times \frac{1}{140 \times 0.85 \times 0.75} \text{ or}$$

$$\text{gph} = \frac{\text{Btu per hr}}{1000} \times 0.011.$$

The 0.75 refers to bonnet efficiency.)

Fuel Input for Gas-Fired Furnaces

Heating contractors contemplating changes in the gas input rate should read manufacturer's instruction sheets for the particular furnace and blower. Although both the size of the orifice and the gas pressure affect the gas input rate, ordinarily a change in the orifice size is the only practical procedure available, since reduction in gas pressure may result in faulty burner performance.

Gas burners reach maximum operating efficiency within seconds after the burner is lighted. Hence, operating cycles as short as two minutes can be maintained without loss of efficiency. In most cases, the heating contractor will not have available nozzles of various sizes, so that as a practical measure, it will usually be found that an adjustment in the controls to make the burner cycle more frequently is the first procedure.

In the case of natural gas having a calorific value of 1000 Btu per cu ft the minimum gas input rate per hr is determined by the equation:

$$\frac{(\text{Btu per hr heat loss})}{1000} \times 1.47 = \text{cu ft per hr, or}$$

$$\frac{\text{Btu per hr heat loss}}{1000} \times 0.025 = \text{cu ft per min.}$$

(Derivation of gas input equation for natural gas having 1000 Btu per cu ft:

$$\text{Btu per hr heat loss} = \text{cu ft per hr} \times 1000 \times 0.85 \times 0.80, \text{ or}$$

$$\text{cu ft per hr} = \frac{\text{Btu per hr}}{1000} \times \frac{1}{0.85 \times 0.80}, \text{ or}$$

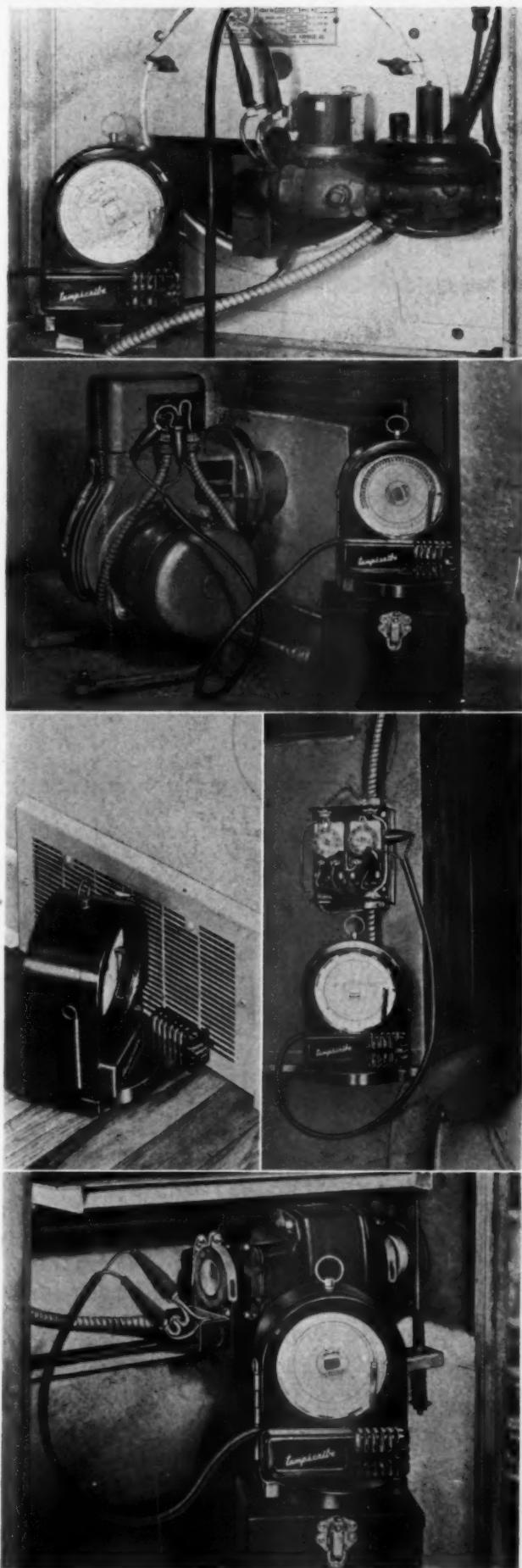
$$\text{cu ft per hr} = \frac{\text{Btu per hr}}{1000} \times 1.47.$$

For gas having calorific values other than 1000 Btu per cu ft, multiply the constant 1.47 by the ratio of 1000

Btu per cu ft. For example, a manufactured gas having a calorific value of 500 Btu per cu ft will have a ratio of 1000/500 or 2.0. The new constant is 1.47×2.0 or 2.94. Hence, in this case the gas input rate is:

$$\frac{\text{Btu per hr heat loss}}{1000} \times 2.94.$$

Measurements of gas input rate can be made by checking the time required for one or more revolutions of one of the dials in the gas meter. In many meters a



Test Instrument in Action

Fig. 3—Operation recorder connected across the terminals of a gas valve.

Fig. 4—Operation recorder connected across the terminals of an oil burner.

Fig. 7—Temperature recorder to measure outlet air temperatures at register.

Fig. 9—Recorder can also be connected across terminals of blower switch.

Fig. 10—Operation recorder can be connected across terminals of blower motor to show blower cycles.

dial is provided at the top which indicates either 0.5, 1.0, or 2 cu ft per revolution. Consider, for example, a gas meter showing 0.5 cu ft per revolution. By using the second hand of a watch it was observed that 2 complete revolutions of this dial required 28 seconds of time. Since 1 cu ft required 28 seconds, the gas flow rate was $\frac{1.0}{28} \times 60$ or 2.14 cu ft per min or $2.14 \times 60 = 128.4$ cu ft per hr.)

Adjustment of Barometric Draft-Regulating Damper

Barometric draft-regulating dampers are recommended for hand-fired, stoker-fired and oil-fired furnaces. After the fuel input has been adjusted, the setting of the barometric damper should be adjusted with the aid of a draft gage. The draft measurements should be made with a hot smokepipe, and the following drafts are recommended, unless the furnace manufacturer specifies otherwise:

Hand-fired coal ..0.06 in. to 0.08 in.

Stoker-fired coal ..0.06 in.

Oil-fired0.04 in.

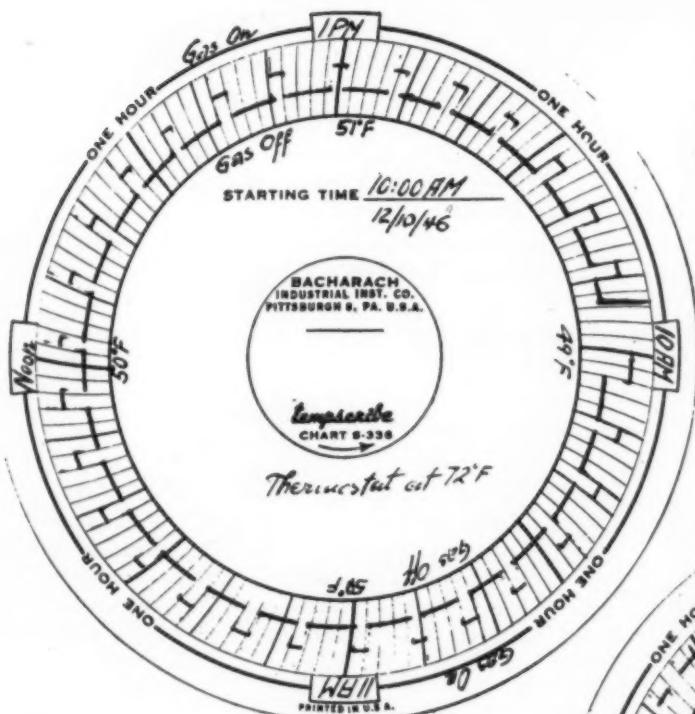
These measurements are made at the point where the smokepipe is attached to the furnace.

In case of gas-fired equipment the barometric damper is not used. However, each furnace should be equipped with a draft hood, frequently referred to as a diverter. Most manufacturers furnish or specify a draft hood to be used with their burner.

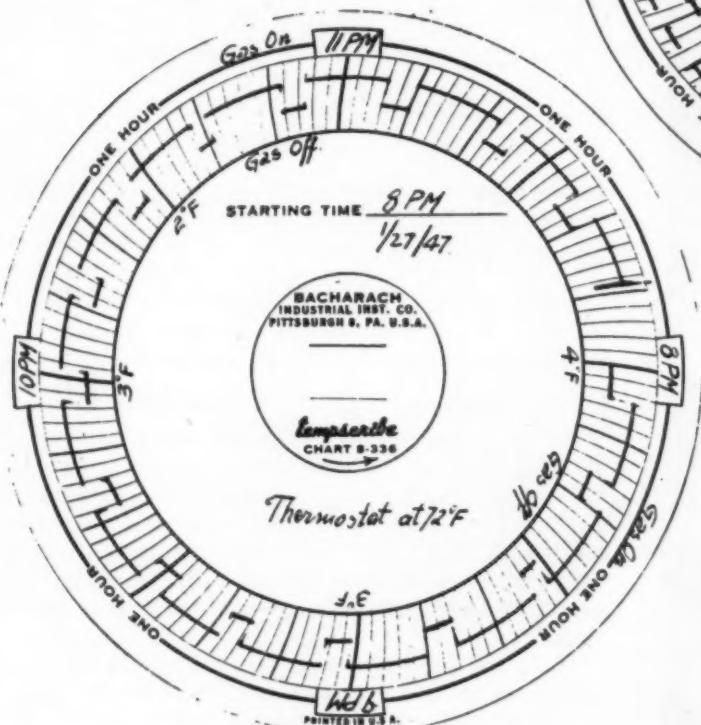
Checking Inputs of Automatic Burners

We come now to the most important step of all in checking heat inputs, particularly in existing installations. The following information has been prepared in co-operation with Mr. R. Ulrich, vice president of the Bacharach Industrial Instrument Company of Pittsburgh, who was assigned the job of developing portable test instruments for use by the warm air heating industry.

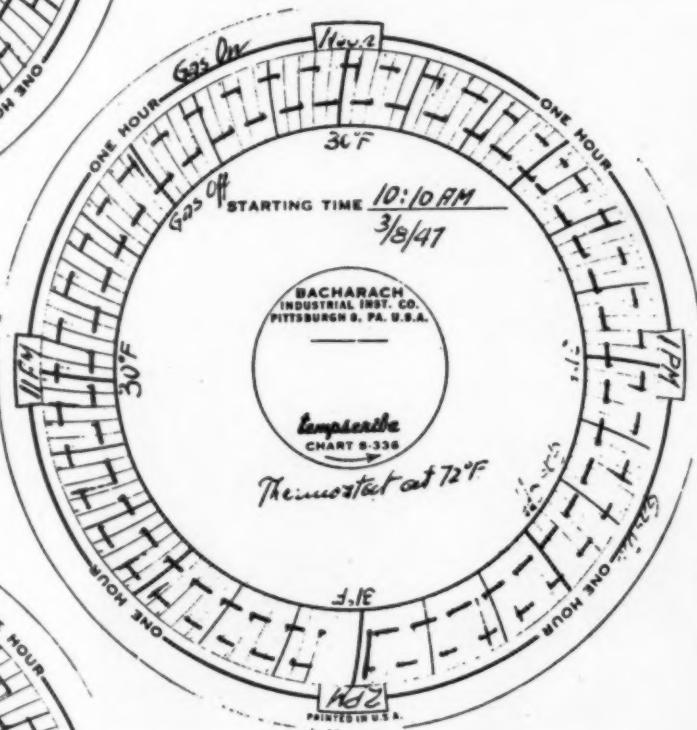
Fig. 3 shows an operation recorder connected across the terminals of a gas valve, and Fig. 4 across those of an oil burner motor. Typical recording charts of 4 hours duration from a gas-fired plant are shown in Fig. 5. It may be observed that the on-period of the burner is indicated by the dash lines on the outer periphery of the chart. The spacing between two



This chart shows that burner was "on" about 26 minutes per hour, during check period of 11 A.M. to 1 P.M., at average outside temperature of 30°F.



This chart shows that burner was "on" about 15 minutes per hour, during check period of 11 A.M. to 1 P.M., at average outside temperature of 50° F.



This chart shows that burner was "on" about 43 minutes per hour, during check period of 9 P.M. to 11 P.M., at average outside temperature of 3° F.

Fig. 5—Burner operation records.

radial lines represents two minutes. For example, the top chart in Fig. 5 shows 15 burner operations between 11 a.m. and 1 p.m. By estimating the time of each burner operation to the nearest $\frac{1}{4}$ minute the total on-period time amounts to almost 30 minutes for the two-hour period, or about 15 minutes per hr. On Fig. 6 this burner time of 15 minutes is shown plotted as point A on the vertical line for 50 deg F, which was the average outside temperature during the two-hour check period.

Similarly points B and C in Fig. 6 represent burner times of 26 minutes per hour and 43 minutes per hour for average outdoor temperatures of 30 deg F and 3 deg F, respectively. By drawing a curve through points A, B, and C it may be observed that it intersects the -10 deg F vertical line at about 52 minutes. This would indicate that if the average outdoor temperature had been -10 deg F the burner would have been operating 52 minutes out of 60, or 87 per cent of the time. Furthermore, by extending curve ABCD to the right until it hits the 60 horizontal line it can be seen that the burner would be operating 100 per cent of the time when the outdoor temperature was about -20 deg F.

In practice the heating contractor will probably not be able to afford the time to visit a given plant on 3 separate occasions to obtain data equivalent to those shown by points A, B, and C. Under these conditions, even a single observation will be better than none at all. For such single-point observations the lines designated as +10, 0, and -10 will be of value. Each of these lines represents the recommended burner "on" time for peak performance for the outdoor design temperatures indicated. It is the writer's opinion that any single-point observation that falls below the appropriate line by not more than 10 to 15 per cent shows an acceptable input. For example, suppose that the outdoor design temperature for a given locality is +10 deg F, and that a single-point observation in this plant gave the data indicated by point B. The desired operating time from the line marked +10 shows 39 minutes, whereas the observed operating time was only 26 minutes, which is only 67 per cent of what it should be.

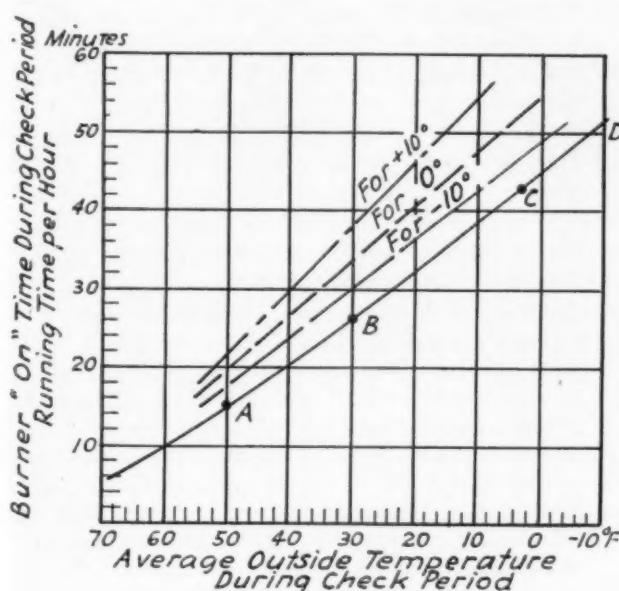


Fig. 6—Plot of data from Fig. 5.

Obviously, a reduction in the gas input rate is indicated. Since these inputs cannot be regulated right "on the nose," any reduction of from 20 to 30 per cent would be acceptable.

On the other hand, suppose that the outdoor design temperature is -10 deg F and the required operating time is 30 min. In this case point B gives 87 per cent of the desired input and the decision might be reached that this is close enough for practical purposes. In the use of an operations recorder of the type indicated it must be realized that there are possibilities of error.

- In estimating the total time from the charts shown in Fig. 5 it is possible to have deviations of as much as 1 minute.
- The chart may be recording a condition which is not normal. That is, a day that is calm and a day of high wind may show differences of as much as 20 per cent on fuel consumption, for the same outdoor temperature. As a rough rule, the gas consumption will increase about 2 per cent for each mile per hour above 10 miles per hr.

- The sun effect or internal heat release may be affecting the input. Observations made in cloudy weather and before the times when the kitchen is used will be satisfactory.

In spite of these obvious limitations, which can be readily overcome by reasonable care in using the operation recorder, the instrument is a valuable tool for the progressive heating contractor.

✓ SETTING BLOWER SPEED

Adjusting the fuel input to the burner is one step towards a satisfactorily balanced system. The next step is to adjust the air volume circulated by the blower. For this purpose, we will refer to a term "100 deg rise." If the air entering the blower housing is 65 deg and the air leaving the bonnet is 165 deg the difference or temperature rise is only 100 deg F. With a given input to a furnace if the rise is only 75 deg F this is an indication that more air than necessary is circulating through the system. On the other hand, if the rise is 120 deg F this is an indication that insufficient air is circulating. In other words, a definite relationship exists between air volume and temperature rise.

The question naturally arises: "Why 100 deg F—why not 90 deg or 110 deg F?" To some extent, the selection of 100 deg F is an arbitrary one, but it is within the temperature ranges specified in existing furnace test codes, and is a reasonable and convenient value to use in field test work.

The process of determining this temperature rise is not too difficult, and consists of the following steps:

- Open all registers and duct dampers.
- Insert a thermometer in return air duct, or if that is not convenient place it near the return grille, unless the return duct passes through cold unheated spaces.
- Locate a second thermometer in the main trunk duct about two feet away from the plenum chamber.
- Both burner and blower should operate continuously until the temperature rise has leveled off. From a

cold start this may take at least 20 to 30 minutes.

- If the temperature rise is less than about 100 deg F reduce the blower speed; if more than 100 deg F, increase the speed.
- Repeat the thermometer readings and check the temperature rise again. If the rise is within the range of about 95 deg to 100 deg F the adjustment may be considered satisfactory.

In any measurement of air temperatures it will be found that some conditions will be noted that may be puzzling to the observer. A few notes regarding measurements may be pertinent at this point.

- In the first place, measurements of air temperatures with thermometers will give only approximate values. A thermometer having a 220 deg scale will, in general, be more satisfactory than one whose scale goes up to 800 deg F. Furthermore, the thermometer stem should project into the air stream at least two inches, and preferably more.
- Thermometer measurements made in the bonnet where the bulb of the thermometer may be exposed to the hot surfaces of the furnace will give readings

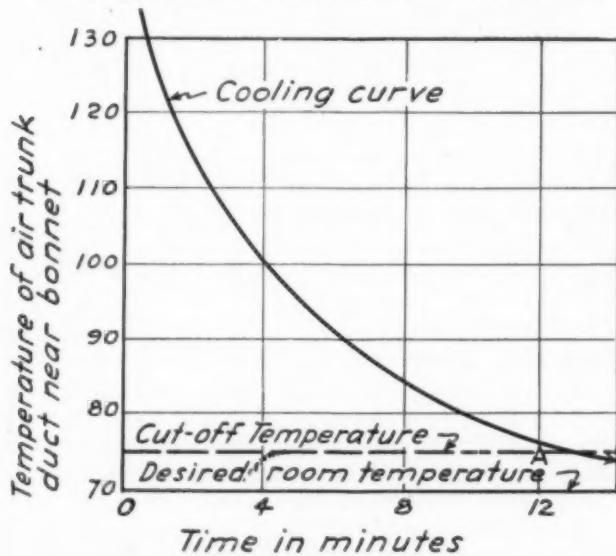


Fig. 8—Adjustment of blower switch is made at cut-off temperature only.

that are too high. The errors may be as small as 5 deg but may be as much as 30 deg or more depending upon the distance of the bulb to the furnace and on the air velocity. Locating the instrument in the trunk duct, out of sight of the hot surfaces, will greatly reduce the errors.

- It may be observed by those who take the time that the air temperatures are not uniform across a duct, or between two trunk ducts. Since this check procedure is not one of refinement but only an approximation, it is generally satisfactory to make the observations in the midpoint of the height of the duct.
- In some cases it may not be practical to make measurements near the bonnet. Under these conditions it is possible to make observations of the air temperatures in the air stream leaving a register. (See Fig. 7, page 85.) Since a drop in temperature of the air stream will occur between the bonnet and the register it is advisable to select a first story register

near the furnace, and preferably within 10 ft of the casing. A difference in temperature between register air and inlet air to the blower of between 90 to 95 deg F will correspond to the temperature rise about 5 deg higher measured near the bonnet. Such measurements of air temperatures can be made with thermometers whose bulbs project inside the face of the register, or by means of a portable recording instrument similar to that shown in Fig. 7.

- In some installations it may be found difficult to reduce blower speeds to a sufficiently low point to obtain a 100 deg rise. This is particularly true if 1) filters have been omitted, 2) filters are newly installed, 3) filter cabinet is open to the basement, or 4) several basement registers not normally in use are opened wide. In the extreme case, where even with minimum speed of the blower the temperature rise is only of the order of 80 deg F, it may be advisable to use a smaller motor pulley. Another aid in this adjustment would be to partially close one or two dampers leading to rooms which are becoming overheated, and then to check the temperature rise.

If the heating contractor will appreciate that this check of temperature rise is not a precision job, but one which gives a practical answer, it should be possible for him to establish a routine procedure after a little practice. Certainly, this practical approach is far preferable to the prevailing method of installing a furnace and then ignoring the most important part of the installation consisting of these few simple "tuning" operations.

✓ ADJUSTING THE BLOWER SWITCH

We come now to the third step, one of the most important of the five enumerated. In this discussion it is assumed that the type of control system used is that in which: a) the room thermostat controls the drafts in a hand-fired furnace, or the burner in an automatic fired furnace, and b) the blower switch controls the operation of the blower. The recommended procedure for setting the blower switch is as follows:

- Replace the thermometer in the main trunk duct at a point about two feet away from the bonnet.
- If the differential adjustment of the blower switch can be adjusted, set it to a value of from 15 to 20 deg F.
- Shut off the burner so that the furnace begins to cool.
- Set the indicator dial on the blower switch to its lowest point, or to the "summer" position so that the blower operates continuously.
- Observe the thermometer in the trunk duct. The temperature will continue to drop. See Fig. 8. Wait until the test thermometer in the trunk duct drops to a point (A in Fig. 8) about 3 to 5 deg above the desired room temperature.
- At this time, slowly and carefully move the indicator dial to a higher setting until the blower stops. This is the proper setting which will cause the blower to operate practically continuously in weather colder than about 40 deg F, and will operate with short and few off-cycles in milder weather. See Figs. 9, 10, (page 85) 11, and 12.

A few additional comments will prove helpful in this procedure:

- It should be observed that the emphasis is placed not on the temperature at which the blower cuts in, but on the temperature at which it shuts off.
- The numbers on the dial of the blower switch are practically ignored in this procedure, and for definite reasons. The instrument may be out of calibration, or more likely the instrument may be located at a position where it is affected by radiation from the furnace or from stratification.
- When the blower is stopped at air temperatures only 3 to 5 deg above the room temperature, it is obvious that the air leaving the register may be on the cool side. This air temperature will prove satisfactory for installations having high sidewall registers, since there is no likelihood of the air stream striking an occupant. Where baseboard registers are used some danger exists of having objectionable drafts in front of the registers. By adjusting the vanes in the two-way adjustable registers it may be possible to direct the air stream away from normally occupied areas. Where this is not possible, then it may be necessary to increase the temperature at which the blower shuts off. With the lower air volumes recommended in this checking procedure, it will be found that minimum register temperatures between 80 and 90 deg will be permissible, depending largely on local conditions. In any case, the cut-off temperature of the blower should be set as low as practicable from the standpoint of possible drafts.

✓ BALANCING AIR DISTRIBUTION

The fourth step in the procedure should ordinarily be started at the time that the adjustments in the blower speed are being made. Briefly stated, the procedure is as follows:

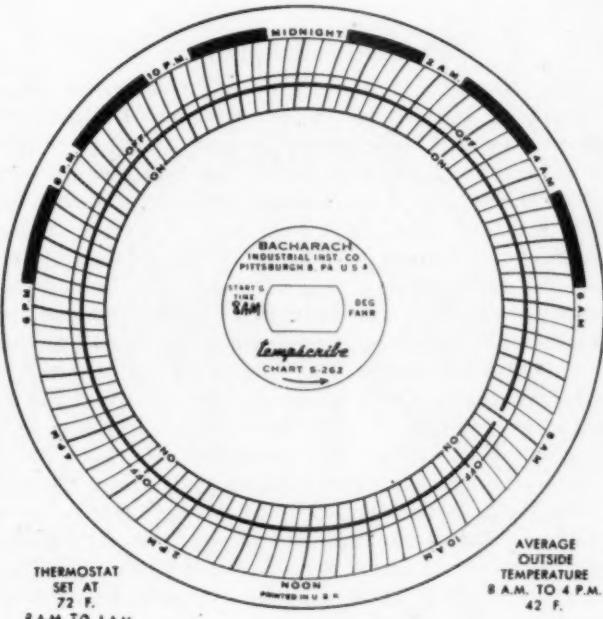


Fig. 11—Operation recorder shows effect of continuous blower operation.

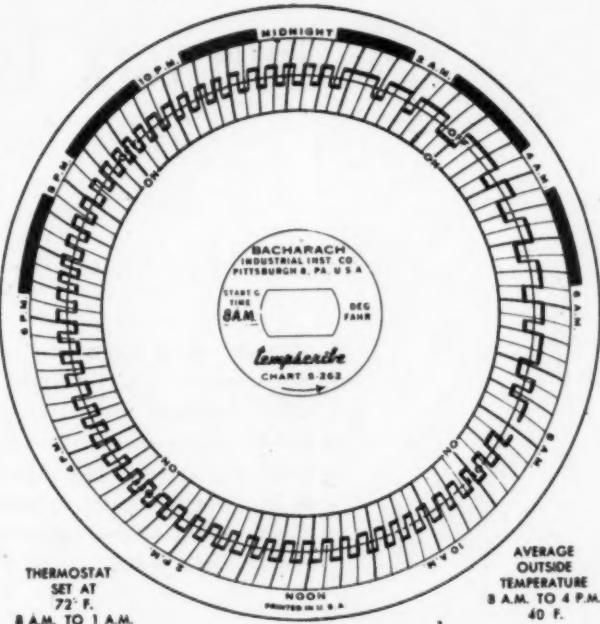


Fig. 12—Contrast this recording of intermittent blower operation with Fig. 11.

- Increase the dial setting on the room thermostat so that the burner and blower are operating continuously.
- Open all dampers, unless the preliminary adjustments, which were made prior to this time, indicate that some of the runs should be partially closed. (See last part of section on blower speed.)
- Place testing thermometers in each room, preferably on top of furniture. When temperatures have stabilized, note the rooms that are overheated. Bathrooms and sun rooms are expected to reach temperatures about 5 deg higher than those for the other rooms in the house.
- Dampers should be partially closed in those rooms that are overheated. Note that closing these dampers will not only reduce air input to the room, but will also cause more air to flow to undamped runs.
- After each damper adjustment, wait until room temperatures have stabilized again, and note the temperatures obtained. In a well-balanced system, the temperatures will not vary more than 1 or 2 deg from the average.

The system is now balanced for continuous operation. All previous adjustments were for the purpose of providing continuous operation in any weather colder than about 40 deg F. When the blower operates intermittently only half the time, as it may when the outdoor temperature is about 55 deg, any slight unbalancing of the plant is not going to be noticeable. The balancing procedure requires time, but the results are worthwhile.

✓ SETTING THE ROOM THERMOSTAT

The fifth and final step is to set the room thermostat at the temperature desired by the owner. Most room
(Please turn to page 166)

Ductwork Estimating Tables

By E. B. Root
Jackson & Church Co.
Saginaw, Mich.

A letter was printed in "The Editor's Notebook" requesting a copy of the booklet (originally printed in 1939) several months ago and the additional letters asking for copies have been piling up ever since. To satisfy this demand Mr. Root has revised the tables, making corrections wherever needed, and they will be published in three articles, after which, reprints (complete in one book) will be available.

SOMEWHERE in the process of converting any given set of engineering plans into a finished and operating winter air conditioning system, the contractor must face the problem of estimating the weight of galvanized iron and the amount of labor required to fabricate the duct work ready for hanging. This fabricating cost, added to the cost of labor required for erection, represents the net cost of the metal work to which must be added overhead and all other expenses, and profit, to arrive at the selling price of the metal work connected with the installation.

No matter what method the contractor uses to estimate his fabricating labor cost, he must base his judgment upon his knowledge of the ability of his mechanics and upon past experience with the required items. The thorough operator will, of course, keep records of cost figures of each common item so that when this item comes up again he has only to turn to this record to find how much metal and how much time is needed.

If the contractor carries this method still further, it naturally comes about that he tends more and more to standardize his items, avoiding new and unfamiliar items, because he knows that the mechanics can do the familiar work more quickly and more cheaply. Also, any unfamiliar item slows up the whole process as the men stop to study, work out, and tinker with ideas and suggestions.

Time and Weight Experiments

Few shops have ever had occasion to work out complete cost records for all the common fittings and sizes of ducts used in residential air conditioning, but E. B. Root, Asst. Gen'l Manager, Furnace Department of the Jackson & Church Co., did have this occasion a few years ago. The firm he was with at that time was fabricating from the blue print complete duct systems, ready to hang, built to the inch and assembled upon the ground plan of the house chalked out on the floor of the shop. The number of such jobs and their variety eventually covered all duct depths from 7 inches to 12

inches and all widths from 4 inches to 44 inches. The weight of material required and the time needed to fabricate were carefully kept. Revisions were made from time to time as weight and time saving ideas were developed so that eventually there issued a complete set of weight and time records for all common sections.

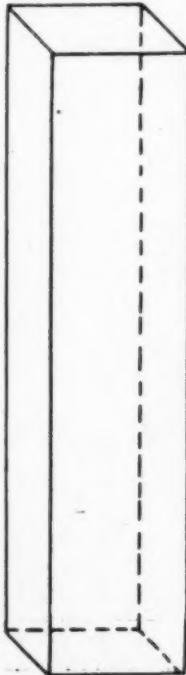
When finally developed, these records were tabulated and grouped so that from the blue print of the job the total weight of iron and the time needed to fabricate could be listed item by item for the complete job.

We present here the complete series of charts showing these records. The charts are self-explanatory, all that is required is to pick the fitting or section by size in the tables and read off the time and material weight.

Possible Cost Reductions

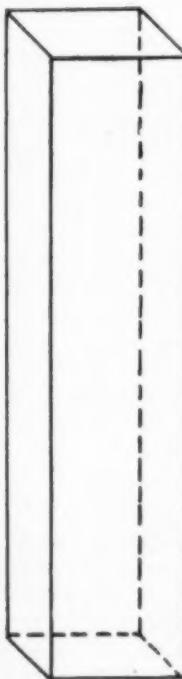
Mr. Root says: "I wish to call attention to the 'time required' items for the various sections. It would be possible to build these sections in less time than shown if it were not for the fact that the time required on these sheets allows for building the entire system to field measurements. If it were possible to build up a stock of the fittings, such could be done in less time, but the sheets assume that each job calls for a complete fabrication. The time required will depend, to some extent, of course, on the equipment used and the skill of the mechanics. The time shown is plotted for 'good' mechanics who waste no time figuring things out, but proceed at once to cutting, forming and assembling the item. The contractor can take these figures and check his own men against typical fittings to set up a comparison percentage for his own mechanics. This percentage might be applied against the entire job or could be used to build up a corrected tabulation based upon a particular shop and set of mechanics."

The complete set of charts cover all common fittings and all depths of ducts from 7 inches to 12 inches.



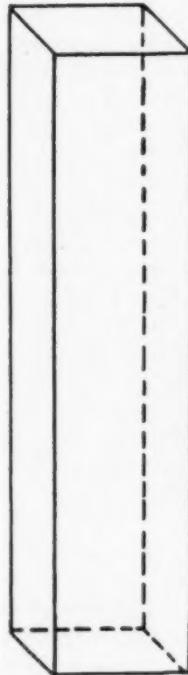
WEIGHT AND TIME FOR RECTANGULAR DUCTS PER JOINT

Width	Depth 7"												Depth 8"																				
	1'				2'				3'				4'				5'				6'				7'								
Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time						
44	10.4	30'	20.8	30'	31.2	30'	.....	.....	.....	.....	.....	.....	.....	.....	.....	44	10.6	30'	21.2	30'	31.8	30'	.....	.....	.....	.....	.....	.....
42	10.0	30'	20.0	30'	30.0	30'	.....	.....	.....	.....	.....	.....	.....	.....	.....	42	10.2	30'	20.4	30'	30.6	30'	.....	.....	.....	.....	.....	.....
40	9.6	30'	19.3	30'	28.9	30'	.....	.....	.....	.....	.....	.....	.....	.....	.....	40	9.8	30'	19.6	30'	29.5	30'	.....	.....	.....	.....	.....	.....
38	9.2	30'	18.5	30'	27.7	30'	.....	.....	.....	.....	.....	.....	.....	.....	.....	38	9.4	30'	18.9	30'	28.3	30'	.....	.....	.....	.....	.....	.....
36	8.8	30'	17.7	30'	26.5	30'	.....	.....	.....	.....	.....	.....	.....	.....	.....	36	9.1	30'	18.1	30'	27.2	30'	.....	.....	.....	.....	.....	.....
34	8.5	30'	16.7	30'	25.4	30'	.....	.....	.....	.....	.....	.....	.....	.....	.....	34	8.7	30'	17.3	30'	26.0	30'	.....	.....	.....	.....	.....	.....
32	6.3	30'	12.6	30'	19.0	30'	25.4	30'	31.7	30'	38.0	30'	44.3	30'	50.7	30'	32	6.5	30'	13.0	30'	19.5	30'	26.0	30'	32.5	30'	45.5	30'	52.0	30'		
30	6.0	30'	12.1	30'	18.1	30'	24.2	30'	30.2	30'	36.2	30'	42.3	30'	48.3	30'	30	6.2	30'	12.4	30'	18.6	30'	24.8	30'	31.0	30'	43.4	30'	49.6	30'		
28	5.7	30'	11.5	30'	17.2	30'	23.0	30'	28.7	30'	34.4	30'	40.2	30'	45.9	30'	28	5.9	30'	11.8	30'	17.7	30'	23.6	30'	29.5	30'	35.4	30'	41.3	30'	47.2	30'
26	5.4	30'	10.9	30'	16.3	30'	21.8	30'	27.2	30'	32.6	30'	38.1	30'	43.5	30'	26	5.6	30'	11.2	30'	16.8	30'	22.4	30'	28.0	30'	33.6	30'	39.2	30'	44.8	30'
24	5.1	30'	10.3	30'	15.4	30'	20.5	30'	25.7	30'	30.8	30'	35.9	30'	41.0	30'	24	5.3	30'	10.6	30'	15.9	30'	21.2	30'	26.5	30'	31.8	30'	37.1	30'	42.4	30'
22	4.8	30'	9.7	30'	14.5	30'	19.3	30'	24.2	30'	29.0	30'	33.8	30'	38.6	30'	22	5.0	30'	10.0	30'	15.0	30'	20.0	30'	25.0	30'	30.0	30'	35.0	30'	50.0	30'
20	4.5	30'	9.1	30'	13.6	30'	18.1	30'	22.7	30'	27.2	30'	31.7	30'	36.2	30'	20	4.7	30'	9.4	30'	14.1	30'	18.8	30'	23.5	30'	28.2	30'	32.9	30'	37.6	30'
18	4.2	30'	8.5	30'	12.7	30'	16.9	30'	21.2	30'	25.4	30'	29.6	30'	33.8	30'	18	4.4	30'	8.8	30'	13.2	30'	17.6	30'	22.0	30'	26.4	30'	30.8	30'	35.2	30'
16	3.9	30'	7.9	30'	11.8	30'	15.7	30'	19.7	30'	23.6	30'	27.5	30'	31.4	30'	16	4.1	30'	8.2	30'	12.3	30'	16.4	30'	20.5	30'	24.6	30'	28.7	30'	32.8	30'
14	3.6	30'	7.2	30'	10.9	30'	14.5	30'	18.1	30'	21.7	30'	25.3	30'	29.0	30'	14	3.8	30'	7.6	30'	11.4	30'	15.2	30'	19.0	30'	22.8	30'	26.6	30'	30.4	30'
12	3.3	30'	6.6	30'	10.0	30'	13.3	30'	16.6	30'	19.9	30'	23.2	30'	26.6	30'	12	3.5	30'	7.0	30'	10.5	30'	14.0	30'	17.5	30'	21.0	30'	24.5	30'	28.0	30'
10	3.0	30'	6.0	30'	9.1	30'	12.1	30'	15.1	30'	18.1	30'	21.1	30'	24.2	30'	10	3.2	30'	6.4	30'	9.6	30'	12.6	30'	16.0	30'	19.2	30'	22.4	30'	25.6	30'
9	2.9	20'	5.7	20'	8.6	20'	11.5	30'	14.4	30'	17.2	30'	20.1	30'	23.0	30'	9	3.1	20'	9.2	20'	12.0	30'	15.3	30'	18.3	30'	21.4	30'	24.4	30'	28.0	30'
8	2.7	20'	5.4	20'	8.2	20'	10.9	30'	13.6	30'	16.3	30'	19.0	30'	21.8	30'	8	2.9	20'	5.8	20'	8.7	20'	11.4	30'	14.5	30'	17.4	30'	20.3	30'	23.2	30'
7	2.6	20'	5.1	20'	7.7	20'	10.3	30'	12.9	30'	15.4	30'	18.0	30'	20.6	30'	7	2.8	20'	5.5	20'	8.3	20'	10.9	30'	13.8	30'	16.5	30'	19.3	30'	22.0	30'
6	2.4	20'	4.8	20'	7.3	20'	9.7	25'	12.1	30'	14.5	30'	16.9	30'	19.4	30'	6	2.6	20'	5.2	20'	7.8	20'	10.3	30'	13.0	30'	15.6	30'	18.2	30'	20.8	30'
5	2.3	20'	4.5	20'	6.8	20'	9.1	25'	11.4	30'	13.6	30'	15.9	30'	18.2	30'	5	2.5	20'	4.9	20'	7.4	20'	9.7	25'	12.3	25'	14.7	30'	17.2	30'	19.6	30'
4	2.1	20'	4.2	20'	6.4	20'	8.5	25'	10.6	25'	12.7	30'	14.8	30'	17.0	30'	4	2.3	20'	4.6	20'	6.9	20'	9.2	25'	11.5	25'	13.8	25'	16.1	30'	18.4	30'



WEIGHT AND TIME FOR RECTANGULAR DUCTS PER JOINT

Width	Depth 9"												Depth 10"												
	1'	2'	3'	4'	5'	6'	7'	8'	1'	2'	3'	4'	5'	6'	7'	8'	1'	2'	3'	4'	5'	6'	7'	8'	
44	10.8	30'	21.8	30'	32.5	30'	...	...	...	...	...	...	...	...	...	...	44	11.0	30'	22.0	30'	33.0	30'	...	...
42	10.4	30'	20.9	30'	31.3	30'	...	...	...	...	...	...	...	...	...	...	42	10.6	30'	21.2	30'	31.8	30'	...	...
40	10.0	30'	20.1	30'	30.1	30'	...	...	...	...	...	...	...	...	...	...	40	10.2	30'	20.4	30'	30.6	30'	...	...
38	9.6	30'	19.3	30'	28.9	30'	...	...	...	...	...	...	...	...	...	...	38	9.8	30'	19.7	30'	29.5	30'	...	...
36	9.2	30'	18.5	30'	27.7	30'	...	...	...	...	...	...	...	...	...	...	36	9.4	30'	18.9	30'	28.3	30'	...	...
34	8.8	30'	17.7	30'	26.5	30'	...	...	...	...	...	...	...	...	...	...	34	9.1	30'	18.1	30'	27.2	30'	...	...
32	6.6	30'	13.3	30'	19.9	30'	26.6	30'	33.2	30'	39.8	30'	46.5	30'	53.1	30'	32	6.8	30'	13.6	30'	20.4	30'	27.2	30'
30	6.3	30'	12.7	30'	19.0	30'	25.4	30'	31.7	30'	38.0	30'	44.4	30'	50.7	30'	30	6.5	30'	13.0	30'	19.5	30'	26.0	30'
28	6.0	30'	12.1	30'	18.1	30'	24.2	30'	30.2	33'	36.2	30'	42.3	30'	48.3	30'	28	6.2	30'	12.4	30'	18.5	30'	24.8	30'
26	5.7	30'	11.5	30'	17.2	30'	23.0	30'	28.7	30'	34.4	30'	40.2	30'	45.9	30'	26	5.9	30'	11.8	30'	17.7	30'	23.6	30'
24	5.4	30'	10.9	30'	16.3	30'	21.8	30'	27.2	30'	32.6	30'	38.1	30'	43.5	30'	24	5.6	30'	11.2	30'	16.8	30'	22.3	30'
22	5.1	30'	10.3	30'	15.4	30'	20.5	30'	25.7	30'	30.8	30'	35.9	30'	41.0	30'	22	5.3	30'	10.6	30'	15.9	30'	21.1	30'
20	4.8	30'	9.7	30'	14.5	30'	19.3	30'	24.2	30'	29.0	30'	33.8	30'	38.6	30'	20	5.0	30'	10.0	30'	15.0	30'	20.0	30'
18	4.5	30'	9.1	30'	13.6	30'	18.1	30'	22.7	30'	27.2	30'	31.7	30'	36.2	30'	18	4.7	30'	9.4	30'	14.0	30'	18.7	30'
16	4.2	30'	8.5	30'	12.7	30'	16.9	30'	21.2	30'	25.4	30'	30.0	30'	33.8	30'	16	4.4	30'	8.8	30'	13.1	30'	17.5	30'
14	3.9	30'	7.9	30'	11.8	30'	15.7	30'	19.7	30'	23.6	30'	27.5	30'	31.4	30'	14	4.1	30'	8.2	30'	12.2	30'	16.3	30'
12	3.6	30'	7.3	30'	10.9	30'	14.5	30'	18.2	30'	21.8	30'	25.4	30'	29.0	30'	12	3.8	30'	7.6	30'	11.3	30'	15.1	30'
10	3.3	30'	6.6	30'	10.0	30'	13.3	30'	16.6	30'	19.9	30'	23.2	30'	26.6	30'	10	3.5	30'	6.9	30'	10.4	30'	13.9	30'
9	3.2	20'	6.3	20'	9.5	20'	12.7	30'	15.9	20'	19.0	30'	22.2	30'	25.4	30'	9	3.3	20'	6.6	20'	10.0	20'	13.3	30'
8	3.0	20'	6.0	20'	9.1	20'	12.1	30'	15.1	30'	18.1	30'	21.1	30'	24.2	30'	8	3.2	20'	6.3	20'	9.5	20'	12.7	30'
7	2.9	20'	5.7	20'	8.6	20'	11.5	30'	14.4	30'	17.2	30'	20.1	30'	23.0	30'	7	3.0	20'	6.0	20'	9.1	20'	12.1	30'
6	2.7	20'	5.4	20'	8.2	20'	10.9	25'	13.6	30'	16.3	30'	19.0	30'	21.8	30'	6	2.9	20'	5.7	20'	8.6	20'	11.5	25'
5	2.6	20'	5.1	20'	7.7	20'	10.3	25'	12.9	30'	15.4	30'	18.0	30'	20.6	30'	5	2.7	20'	5.4	20'	8.2	20'	10.9	25'
4	2.4	20'	4.8	20'	6.3	20'	9.7	25'	12.1	25'	14.5	30'	19.4	30'	23.0	30'	4	2.6	20'	5.1	20'	7.7	20'	10.3	25'



WEIGHT AND TIME FOR RECTANGULAR DUCTS PER JOINT

Depth 12"

Width	1'						2'						3'						4'						5'						6'					
	Weight	Time																																		
44	11.4	30'	22.7	30'	34.1	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	11.0	30'	22.0	30'	33.0	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	10.6	30'	21.2	30'	31.8	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	10.2	30'	20.4	30'	30.6	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	9.8	30'	19.7	30'	29.5	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	9.4	30'	18.9	30'	28.3	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	7.1	30'	14.2	30'	21.3	30'	28.4	30'	30.6	30'	42.6	30'	49.7	30'	56.8	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	6.8	30'	13.6	30'	20.4	30'	27.2	30'	34.0	30'	40.8	30'	47.6	30'	54.4	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	6.5	30'	13.0	30'	19.5	30'	26.0	30'	32.5	30'	39.0	30'	45.5	30'	51.9	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	6.2	30'	12.4	30'	18.6	30'	24.8	30'	31.0	30'	37.1	30'	43.3	30'	49.5	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	5.9	30'	11.8	30'	17.7	30'	23.6	30'	29.4	30'	35.3	30'	41.2	30'	47.1	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	5.6	30'	11.2	30'	16.8	30'	22.3	30'	27.9	30'	33.5	30'	39.1	30'	44.7	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	5.3	30'	10.6	30'	15.9	30'	21.1	30'	26.4	30'	31.7	30'	37.0	30'	42.3	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	5.0	30'	10.0	30'	14.9	30'	19.9	30'	24.9	30'	29.9	30'	34.9	30'	39.9	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	4.7	30'	9.4	30'	14.0	30'	18.7	30'	23.4	30'	28.1	30'	32.8	30'	37.4	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	4.4	30'	8.8	30'	13.1	30'	17.5	30'	21.9	30'	26.3	30'	30.7	30'	35.0	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	4.1	30'	8.2	30'	12.2	30'	16.3	30'	20.4	30'	24.5	30'	28.5	30'	32.6	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	3.8	30'	7.6	30'	11.3	30'	15.1	30'	18.9	30'	22.7	30'	26.4	30'	30.2	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	3.6	20'	7.2	20'	10.9	20'	14.5	30'	18.1	30'	21.7	30'	25.4	30'	29.0	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	3.5	20'	6.9	20'	10.4	20'	13.9	30'	17.4	30'	20.8	30'	24.3	30'	27.8	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	3.3	20'	6.6	20'	10.0	20'	13.3	30'	16.6	30'	19.9	30'	23.3	30'	26.6	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	3.1	20'	6.3	20'	9.5	20'	12.7	25'	15.9	30'	19.0	30'	22.2	30'	25.4	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	3.0	20'	6.0	20'	9.1	20'	12.1	25'	15.1	30'	18.1	30'	21.1	30'	24.2	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	2.9	20'	5.7	20'	8.6	20'	11.5	25'	14.3	25'	17.2	30'	20.1	30'	23.0	30'	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...



REDUCING JOINT WITH ONE BRANCH

Depth of Duct 7"

C	27"						24"						21"						18"						D													
	D	A-B	D	A-B	D	A-B	D	A-B	D	A-B	D	A-B	D	A-B	D	A-B	D	A-B	D	A-B	D	A-B	D	A-B	D	A-B	D	A-B	D	A-B								
44	28.1	90'	24.4	90'	23.6	90'	27.2	90'	22.8	90'	20.4	90'	21.1	90'	19.0	90'	19.6	90'	18.5	90'	17.9	90'	17.3	90'	16.8	90'	16.2	90'	15.6	90'								
36	23.4	90'	22.0	90'	22.3	90'	28.3	90'	25.4	90'	22.0	90'	19.7	90'	19.0	90'	17.8	90'	16.8	90'	16.2	90'	15.7	90'	15.2	90'	14.7	90'	14.2	90'	13.7	90'						
34	24.5	90'	23.5	90'	23.6	90'	30.7	90'	26.7	90'	21.2	90'	19.0	90'	17.1	90'	15.5	90'	14.3	90'	13.2	90'	12.3	90'	11.9	90'	11.4	90'	10.7	90'	10.3	90'						
32	23.6	90'	23.6	90'	23.7	90'	30.7	90'	26.7	90'	20.8	90'	18.3	90'	16.3	90'	15.3	90'	13.7	90'	12.3	90'	11.9	90'	11.2	90'	10.7	90'	10.2	90'	9.8	90'						
30	23.7	90'	23.7	90'	23.8	90'	30.7	90'	26.8	90'	20.9	90'	18.4	90'	16.4	90'	15.4	90'	13.2	90'	12.2	90'	11.8	90'	11.2	90'	10.6	90'	10.1	90'	9.6	90'	9.1	90'				
28	23.8	90'	23.8	90'	23.9	90'	30.7	90'	26.9	90'	21.0	90'	18.5	90'	16.5	90'	15.5	90'	13.4	90'	12.4	90'	11.9	90'	11.3	90'	10.7	90'	10.2	90'	9.7	90'	9.2	90'				
26	24.7	90'	24.7	90'	24.8	90'	30.7	90'	27.0	90'	21.1	90'	18.6	90'	16.6	90'	15.6	90'	13.5	90'	12.5	90'	11.9	90'	11.3	90'	10.7	90'	10.1	90'	9.5	90'	9.0	90'				
24	24.8	90'	24.8	90'	24.9	90'	30.7	90'	27.1	90'	21.2	90'	18.7	90'	16.7	90'	15.7	90'	13.6	90'	12.6	90'	12.0	90'	11.4	90'	10.8	90'	10.2	90'	9.6	90'	9.1	90'				
22	24.9	90'	24.9	90'	25.0	90'	30.7	90'	27.2	90'	21.3	90'	18.8	90'	16.8	90'	15.8	90'	13.7	90'	12.7	90'	11.6	90'	11.0	90'	10.4	90'	9.8	90'	9.3	90'	8.8	90'				
20	25.0	90'	25.0	90'	25.1	90'	30.7	90'	27.3	90'	21.4	90'	18.9	90'	16.9	90'	15.9	90'	13.8	90'	12.8	90'	11.7	90'	11.1	90'	10.5	90'	10.0	90'	9.5	90'	9.0	90'	8.5	90'		
18	25.1	90'	25.1	90'	25.2	90'	30.7	90'	27.4	90'	21.5	90'	19.0	90'	17.0	90'	16.0	90'	14.0	90'	13.0	90'	12.4	90'	11.8	90'	11.2	90'	10.6	90'	10.1	90'	9.6	90'	9.1	90'	8.6	90'
16	25.2	90'	25.2	90'	25.3	90'	30.7	90'	27.5	90'	21.6	90'	19.1	90'	17.1	90'	15.1	90'	13.1	90'	12.1	90'	11.5	90'	10.9	90'	10.3	90'	9.8	90'	9.3	90'	8.8	90'	8.3	90'	7.8	90'
14	25.3	90'	25.3	90'	25.4	90'	30.7	90'	27.6	90'	21.7	90'	19.2	90'	17.2	90'	15.2	90'	13.2	90'	12.2	90'	11.6	90'	11.0	90'	10.4	90'	9.9	90'	9.4	90'	8.9	90'	8.4	90'	7.9	90'
12	25.4	90'</td																																				

OPEN for DISCUSSION

A page devoted to the presentation of problems, their solutions and reader's viewpoints on both. Contributions are invited.

Basement Moisture Problem

I HAVE a customer who is troubled with excessive basement moisture during humid weather. The concrete walls were supposedly waterproofed and are covered with knotty pine. I installed a small fan, but it does not take care of the problem.

ROSCOE ALLISON.

Connersville, Indiana.

Roose Discusses Airborne Moisture

• Our readers are often asked to explain the causes of basement moisture which shows up in the form of damp walls and sweating pipes. Here Robert W. Roose—Special Research Assistant in charge of testing in the Warm Air Research Residence at the University of Illinois—discusses airborne moisture.

Further discussions or experiences with the problem are invited.—ED.

ROSCOE ALLISON'S problem, excessive basement moisture during humid weather, is not an easy one to correct. It must be realized that it is caused by the high moisture content of the air coming in contact with the relatively cool basement surfaces and condensing on them.

This problem may be corrected by doing one of two things.

First, the amount of moisture in the air must be reduced to prevent excessive condensation. To do this the basement windows should be closed during the season when the relative humidities are high. Thus, by preventing the entrance of the outside air and its high quantity of moisture at this time, the amount of moisture contained in the basement air is kept relatively low. Using this method, the basement windows should be opened in the dry parts of the season when the moisture content of the outside air is relatively lower. Of course, the ideal method of correcting this disturbing problem would be to take the excess moisture out of the air so that it could not condense out on the cooler surfaces. This, however, is not easy to do, especially where there is excess moisture in the air as is so prevalent in the states adjoining bodies of water. One moisture-absorbent that has been tried and has been found partially successful is calcium chloride. It may be purchased in 100 lb. sacks for about \$3.00 per sack. This quantity may do the necessary amount of

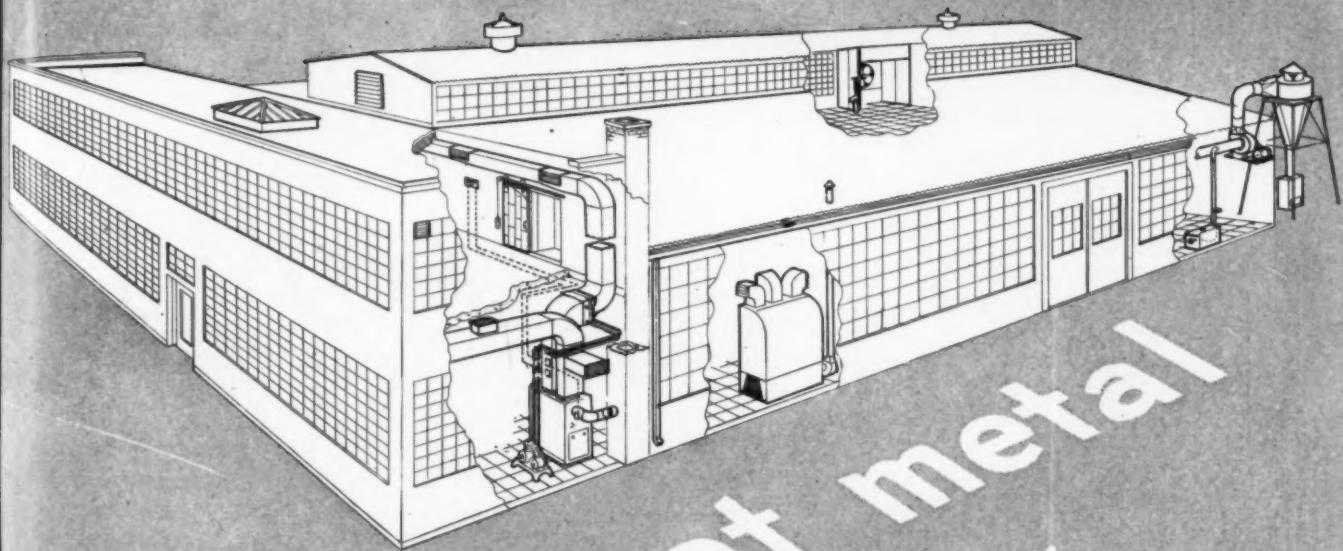
moisture-absorbing for about one summer season if the basement can be kept tight, eliminating the entrance of outside air. Thus, it is shown that either or both of the above mentioned suggestions may aid in correcting the moisture-in-the-air problem.

The second method of correcting this problem is to raise the temperature of the walls and other surfaces above the "dew-point", or condensing point, to prevent the moisture from condensing on them. This may be done by applying an interior wall surface of about $\frac{1}{2}$ or $\frac{3}{4}$ inch of insulating board out away from the basement walls nailed to furring strips about 1 or 2 inches thick. The obvious result is that the temperature of the interior wall surfaces is raised because of the additional insulating qualities of the board used. However, when this is done it is desirable to coat the inside walls of the basement foundation with some moisture-proof paint, or a better solution is to have the moisture-proofing done on the outside during construction by applying a coat of asphalt to the outside of the foundation before the fill is made. This coating eliminates the possibility of any moisture from coming through the wall from the outside. To raise the temperatures of the walls and other surfaces further, it may be desirable to operate the heating plant and deliver heat only into the basement space. Obviously, this delivery of heat can best be accomplished with a forced warm air system having one or two warm air branches supplying the heat into the basement room. In usual conditions found in the mid-western states where basements have no insulating boards for their interior wall, an air temperature rise of about 5 to 8 F is all that is necessary. In an average size basement room of about 25' x 15', an equivalent of one ton of coal for an average summer season is required to produce this increase. This air temperature rise may not be necessary at all, or at least not as great, if the insulating board has been installed in the basement, as mentioned above.

An additional feature, that may be incorporated within the construction of the homes to be built in the future, is that of using full size windows together with terraced areaways to permit the maximum amount of light, and even sunlight, to enter. This feature helps eliminate the moisture and in so doing makes the basement more livable.

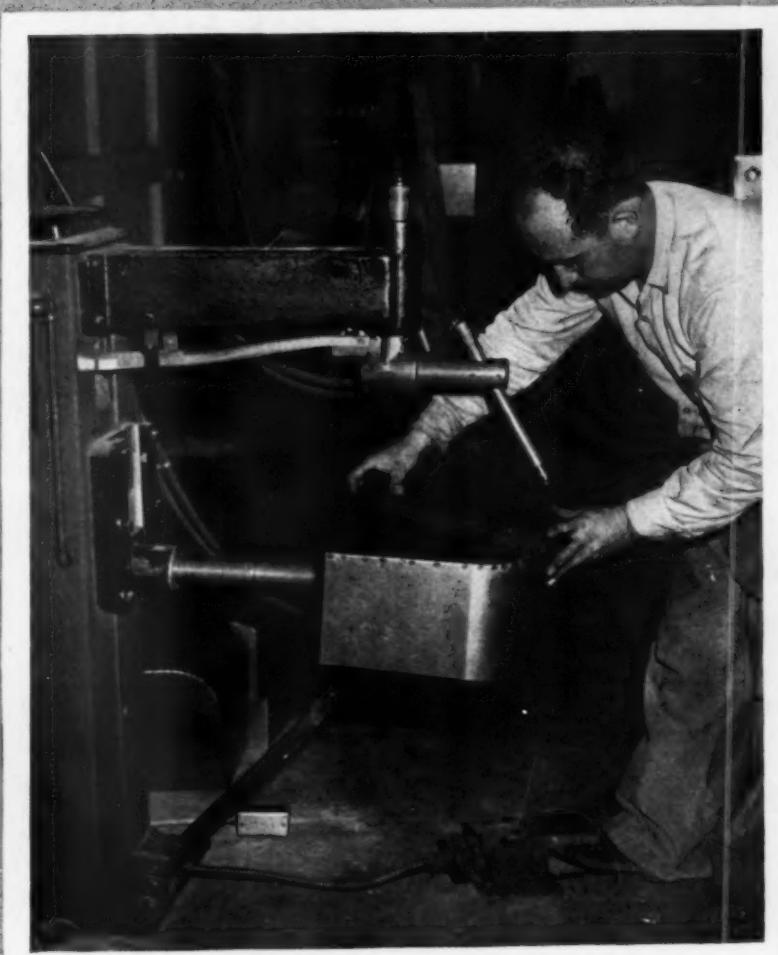
ROBERT W. ROOSE.

Urbana, Illinois.



sheet metal Section

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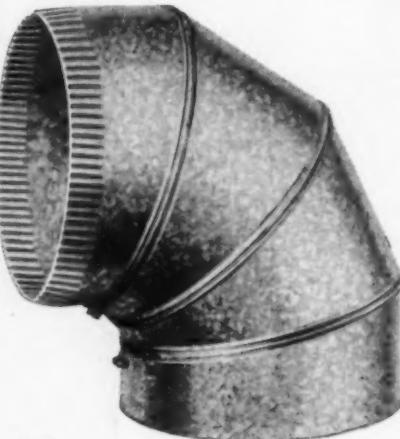
Inland Steel Products

MILWAUKEE 1, WISCONSIN

BALTIMORE 24, MARYLAND
CINCINNATI 25, OHIO
KANSAS CITY 8, MISSOURI

BUFFALO 11, NEW YORK
CLEVELAND 14, OHIO
LOS ANGELES 23, CALIFORNIA

CHICAGO 9, ILLINOIS
DETROIT 2, MICHIGAN
ROCHESTER 9, NEW YORK



G-140

Production by Departments Aids Sheet Metal Fabricator

By R. C. Nason
Long Island, N. Y.

INSPECTION of the generously-tooled plant of Hercules Food Service Equipment, Inc., Brooklyn, N. Y., producers of a full line of metal products for the preparation of food in stainless steel, aluminum and other metals, with considerable deep drawing, substantiates the shop-planning idea of departmentalization. Experience here demonstrates that it is possible to follow practical routing and prevent confusion.

A visit to this processing plant finds the shears near the stock entrance doors. This arrangement seems to duplicate similar arrangement elsewhere. But in deep-drawing and machine forming as done here it saves time to prepare blanks for presses without extra haulage. The relatively small pieces therefore are easily moved to the presses without loss of time or extra labor.

Use of Presses

As already suggested, the fabrication of kitchen and galley products requires the daily use of large power presses. This holds true at Hercules, where two Bliss toggle presses are outstanding of a total of 50 presses of various classes and sizes. One of these large units is rated at 200 tons, the other 350 tons. When possible, depending on the blank material, whether stainless steel or aluminum, whether the temper is soft or medium, draws here sometimes run as deep as 16 in. or a trifle more. To effect such deep work, however, usually calls for annealing, which is handled in this plant in a Chicago Flexible Shaft Co. furnace.

In the matter of making "stock" pots, for example, which are often made up to 18 in. deep, the usual procedure requires two draws of 9 in. each, with annealing between draws to redistribute grain structure and thus render the sheet metal suitable for the succeeding draw. This is necessary since deep drawing usually calls for "soft" metal, good lubrication, good dies and other optimum conditions.

In a large fabricating plant such as Hercules, the number of dies that have to be made and preserved for future use is enormous. The capital investment in such dies frequently runs into important sums. This is partially due to factors such as metal variations since stainless steel, aluminum and other sheeting, are all in daily process here. Die design must be slightly different for all metals and also for all different tempers, thicknesses and for varied draw depths.

Plant Has Machine Shop

It is on this account that Hercules has its own

machine shop. This occupies about 10,000 sq. ft. Equipment includes lathes, shapers, grinders, etc., most of the equipment found in a tool and die shop. Having such a shop allows this fabricator to develop new models and new sizes of existing models. Although the company's line numbers over 300 separate items they have by no means ceased trying to keep up-to-date and meet competition. For if there is one thing that Hercules prides itself on, it is its acceptance of improved output and willingness to pioneer to achieve it. Rarely are fewer than 15 men employed in the Hercules machine shop, alone.

One item shipped out almost daily by this fabricator is coffee urns, for almost every restaurant needs them. After the body, or urn, has been made, this being perhaps the simplest mechanical feature involved, there must be fittings added like faucets, fluid indicator, or sight glass, leakproof nipples, legs and a suitable cover.

Other Departments

Hercules has a separate grinding and polishing room, as well as a separate welding room and a tinning department. At the time of this writer's visit they were tinning muffin baking pans. The initial step here, of course, is the multiple pressing of cup-like depressions about 1½ in. deep by 2 in. diam. Next "ears" or other overage fins are ground off. Then the work goes to the tinning department where a series of vats, nearly 50 ft. long, permit chain operations in which an employee, standing before each vat, dips the product and hands it to his neighbor.

Operations include pickling, rinsing, fluxing and tinning. The operator last in line hands the work to "trimmers" who grind off selvage thus to give the product the finished appearance that has earned this fabricator an enviable reputation.

Production Aids

No doubt there are many food equipment plants that have tooling equal to that here observed. But some of the machinery in use is a little out of the ordinary. Such as electric seam welding equipment with which Hercules welds a longitudinal seam on a 24-in. refuse can in a matter of a few seconds. Or the 158-ft. crane with twin chain blocks so both ends can be used at once; or their abrasive and cutting wheels, or air riveters and air rivet squeezers for attaching pot handles and similar operations.



Some views of the Hercules plant showing the scope of the equipment in use.

Hercules has designed and developed welding jigs of several kinds for various products. One noted was that resembling a windmill and resting on the floor. On it a welder places stamped shallow trays whose flanges have been formed by power press but corners have to be closed by welding. The welder quickly forms the corner, revolves the tray so that the next corner to be closed is on top. Materials handling is facilitated by the use of several electric trucks for interdepartmental moves.

The 50 presses here enable Hercules to make stamped and drawn work from shallow trays to 20-gal. steam kettles and refuse cans up to 18 in. diam. by 24 in. deep, of 14 gage steel. There is a high activity rate inherent in many of the operations which necessitates

shifting of work from department to department. The work is brought to the tools rather than the tools to the work, as a rule.

Mass production methods installed during the war have been continued here. Having been engaged largely in work for the armed forces in the war, now has come the job of redesign to meet modern demand, adding to the line for reconversion to keep pace with this fabricator's policy of making "everything in metal for the preparation of food." The customers are restaurants, hotels, ships, hospitals, institutions, all users whether on land or on sea. "If it's for food Hercules makes it," is their slogan. Gross floor area is 100,000 sq. ft.

TWENTIETH CENTURY FUND in its study "America's Needs and Resources" presents this outline of total housing needs.

Deterioration of existing structures which will have to be replaced or rehabilitated should, in the period 1900-1940, have required an annual expenditure of approximately \$2.2 billion for replacement and improvement. Actually, less than \$650 million was spent for that purpose per year. And the war period left another backlog of replacement construction. Further, there is the demolition of housing by man or nature affecting 40,000 units every year.

The Fund's economists estimate that a 15-year program for rehabilitation of existing structures would involve 5.5 million dwelling units. The bigger part of such a long-range program would be with the replacement of substandard, obsolete and demolished housing. That program calls for new construction of 11.5 million

dwelling units. Even this does not comprise the whole job, for there is still the need for new houses on the part of doubled-up families and of new families. These "net additions" to the housing supply will require, until 1960, an estimated total of roughly 8.1 million dwelling units.

In other words, replacements and net additions together call for about 19.7 million new dwelling units within the period ending in 1960. If the program is to be met, we will have to supply about 1.3 million new units every year.

This can be done, say the Fund's economists, if the average cost for dwelling units does not exceed about \$5,600. Cost reducing production techniques must bring prices to that level. If the construction industry fails to accomplish that objective declares the Fund, the building boom to benefit the broad masses of home seekers will never get under way.

Tools and Their Uses

A series dealing with the various tools that are used in and adapted to sheet metal work. The articles will discuss common uses as well as unusual applications that may not be familiar.

By Ernest E. Zideck
Sheet Metal Consulting Engineer

Press Blanking

WE HAVE said in the foregoing article dealing with blanking of sheet metal parts in quantities warranting the procurement by the shop of either bandsaw jigs or press dies, that the choice of the method by which to do the task and of the tools the method calls for is determinable by circumstances, among which obviously figures the tool or machine which we have on hand and can use in the work without ordering, and waiting for, additional equipment. A second consideration bearing on the choice of the method and of tools in connection is the gauge of the sheet we must use in the blanking. If it is a gauge exceeding 22-gauge in thickness, and if the metal is not a soft one, then, unless we have a press of correct capacity at

hand and solid steel dies to operate in it, the stacked metal band-sawing method is preferable. But if the metal is thin and soft, terne plate, galvanized or aluminum in the 24 to 30 gauges, we can do blanking to advantage in a suitable press, by what we call plate dies, either steel plate dies or Kirksite plate dies, extensively dealt with in several articles appearing in the AMERICAN ARTISAN under "Press Brake Series," in 1946.

Characteristics of Press

In Fig. 1, of the accompanying drawings relating to blanking by plate dies, we show roughly a conventional double-action press, having an open back and a base large enough for mounting upon it die-plates of considerable length. This press, if we do blanking only

Fig. 1 Essentials of blanking press operation (see text)

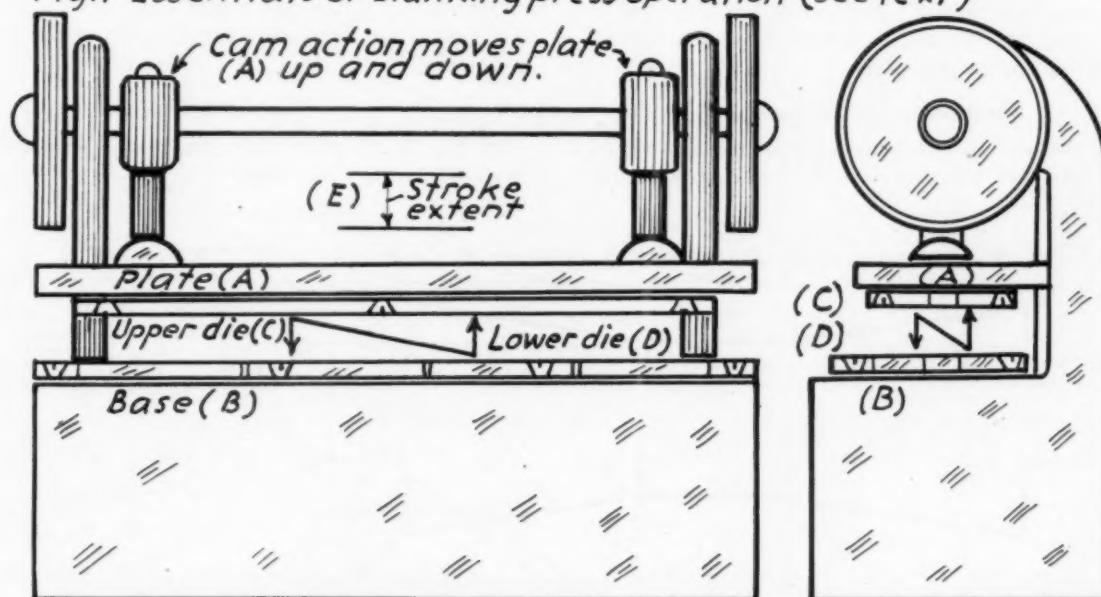
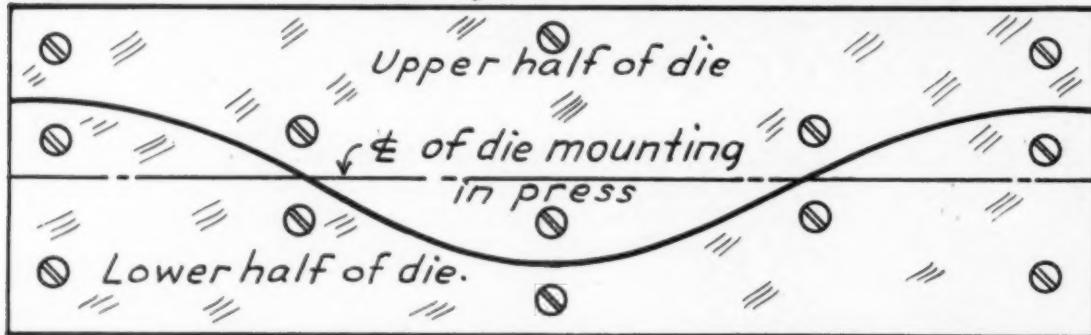


Fig. 2 Plate dies mounting on plate (A) and base (B)



Note: In elbow sections blanking sheet is turned about to receive the middle sections without metal waste.

in it, need not have much of a *stroke*, as we would need in a press doing *forming*. Plate (A) of the press is equivalent to the ram of a press brake, moving up and down by the action of cams or cranks, whichever are employed in the press construction. Commonly the solid die, here marked by (C) and called the upper die, is mounted upon the (A) plate. It is much more practical to get another plate, one or more inches in thickness, and large enough to bolt to the (A) plate through standard bolt holes or bolting provisions, and then fasten the die-plate to it. This auxiliary plate may then be drilled for holes in any number, so that various die-plates may be bolted to it without the (A) plate being marred by holes other than provided in it, commonly bolting arrangements in the sides of the plate, with cast-in protrusions containing the fastening provisions. That same applies to the fastening of the lower, the (D) die-plate, to the base (B). We do not show these auxiliary plates in the drawing, their use depending much on the depth of the press-stroke. If this stroke does not admit of both the upper and the lower die-plates being mounted on said auxiliary plates, then the upper die should be so mounted and the (D) die, reposing on the base (B), might be held in position by means provided in the base. Inasmuch as the (D) die would lie flat on the smooth surface of the (B) base, we may use only $\frac{1}{4}$ inch thick auxiliary plate through which to bolt and hold the die-plate, the $\frac{1}{4}$ inch plate bolting to the base.

Positioning Die Plates

The die-plates must be invariably in the middle of the plate (A) and the base (B), so that the shearing

of the sheet metal is equally distributed laterally from the *center line*, as shown in Fig. 2. Whether the dies be just halves, acting as shear blades do in a squaring shears, as shown in Fig. 2; or whether they be dies doing the shearing of the whole blank, as in Figures 3, 4, and 5; the approximate "middle" of the shear-lines should be in the middle of the (A) and the (B) areas. There might be, in multiple blanking at one stroke of the press, shear-lines extending sideways from the center line indicated in Fig. 2, and if so, the lines must be kept fairly equal each way from the center line. This rule applies to all press-blanking, whether it is done in a large press as shown, or in a punch press having a base of only 12 x 14 inches. In the latter instance the centering of the work is that much more important because the upper dies must be centered upon the small area of the part (A). Where at all practical, die-plates should be designed and made in two longitudinal halves, even if they are for entire perimeter blanking, because then it is possible to repair and sharpen the shearing edges and eventually insert another piece of the plate in-between the two halves, thereby obtaining the required dimensions of the blank area. We can make the dies in one piece, originally, and when the blades are dull or incorrect in another way, we can cut them in two, lengthwise, fit each half to correspond to the shear line, and then insert a strip in-between to compensate for the lack of proper width in the die.

Dies for Elbows

In Fig. 2, we show how dies would be made (and operate) in case we wanted to blank out sections of

Fig. 3 Press-blanking of a double-register box parts



Note: (B-B) Part is flanged and spotwelded to (A) part.

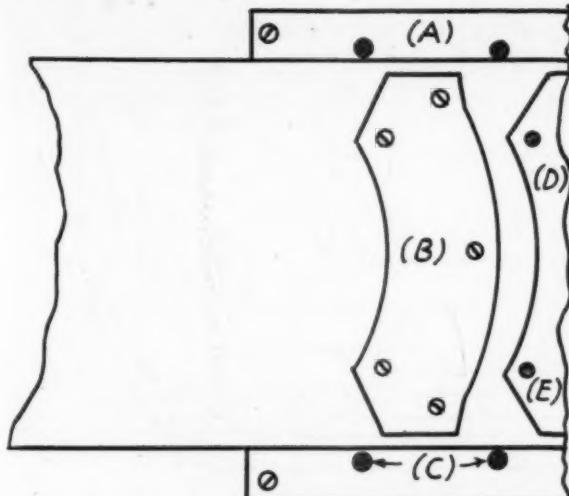


Fig. 4 Sheet-feeding in press blanking.

- (A) Support plate bolted to base plate.
- (B) Lower die shown with blank removed.
- (C-C) Sheet guide pins in plate (A)
- (D) Opening in sheet after blank removed.
- (E) Pins in (A) Gaging distance of sheet feed.

elbows. Because two sections to each elbow are wanted with one side straight, the one-piece die, cutting both of the curved sides, would produce only the curved-sides sections but not the end sections having straight sides. Therefore, the one-half die shown is the preferable one, although more sheet manipulation is required by its use. Another advantage of this half-die is that the shear-line can be repaired, sharpened, corrected and otherwise dealt with without damage to the die,

because there is plenty of margin in the plate for eventual cutting off of a portion along the shear-line. If we use halves of the dies their bolting to the underlying plate must be that much more secure because the sheared metal will have a tendency to push the dies apart, just as a shear blade would do, there being nothing to prevent its shifting away from the other blade. The above does not imply that the one-piece die need not be secured to the plate as solidly; it must, but on account of the shearing happening on all sides simultaneously, there is less tendency, in the one-piece die, to shift to one side. Bolting-down of the die-plates must be solid and secure because of the danger of the shearing edge of the dies being damaged in the plates shifting. For thin metal we can use a $3/16$ or $1/4$ inch thick die-plate, but the thinner the plate the more hold-down bolts we must use to prevent spring-back or rising with the mating plate. If we work gauges thicker than the 22 gauge, the die-plates better be $3/8$ or $1/2$ inch thick. Needless to say, die-plates should be bolted down with bolts or screws hidden in the metal, so that the heads of same do not protrude above the die surface, scratching the sheet worked and, possibly, interfering with the dies' work. The dies should be adjusted (by regulating the stroke or underlying spacers) to slide one into the other or one past the other by the metal thickness worked, plus $1/64$ of an inch.

Preventing Sheet Rise

If we employ one-piece dies (such as would blank out in one piece and by one press stroke blanks indicated in Figures 3, 4 and 5), there will be a tendency in the sheet to rise along with the male die, sticking to it. To prevent that, we use pieces or strips of elastic rubber, glued to the plate of the die. If the thickness of the die-plate permits we can drill appropriate size holes in the margin outside the die proper and insert rubber plugs in the holes, getting away from using glue in that respect. Coiled springs are less wanted for the service because of scratching the sheet and their tendency to jump out of the holes. In making

Fig. 5 Part and hole blanking by dies.

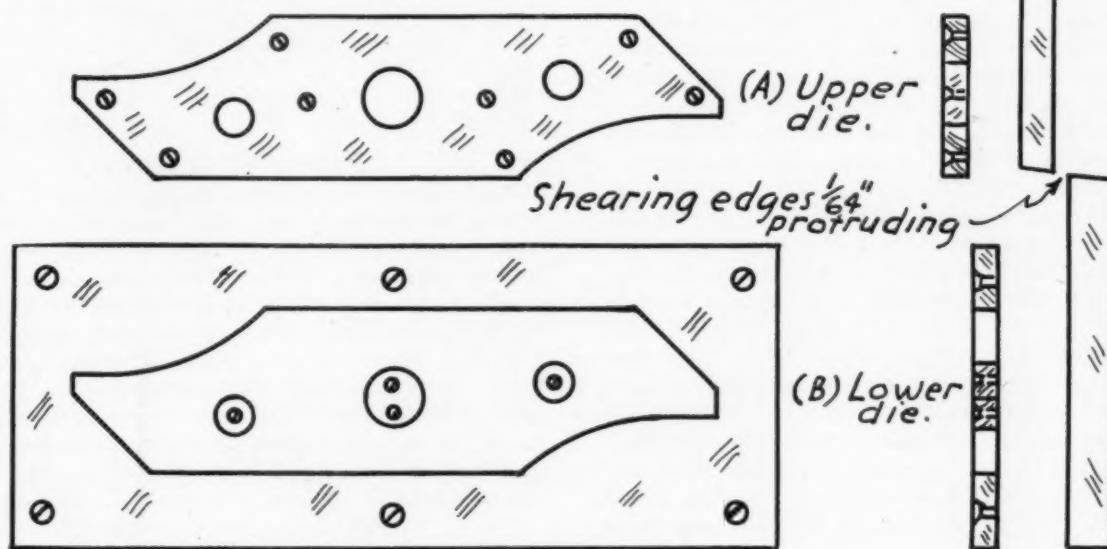
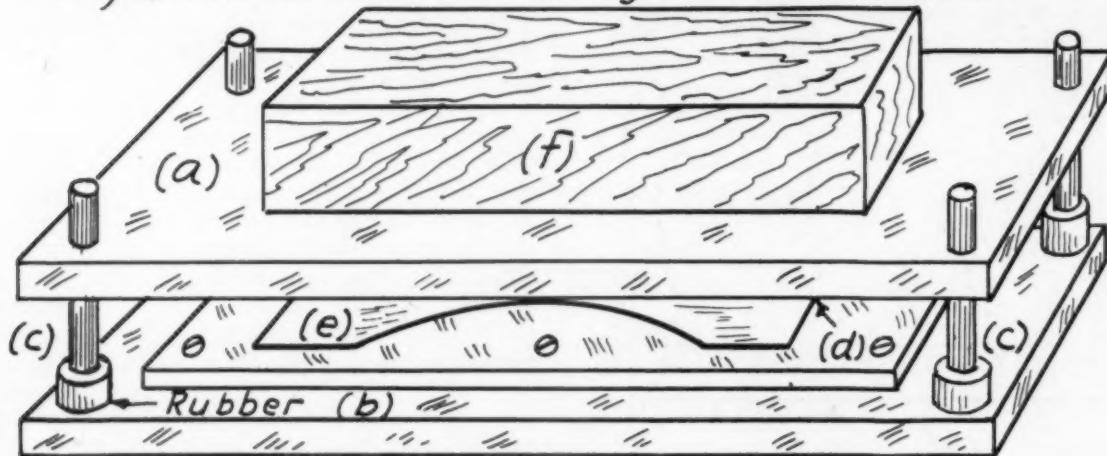


Fig. 6 Preferable blanking die construction



these plate dies we commonly take the well-prepared sheet metal pattern and mark with a sharp instrument along its shearing edges, receiving the lines on the plate intended for the die. We use the band saw blade, sawing $1/32$ of an inch away from the marked line, and then filing or grinding the cutting edge to midway of the line. In Fig. 5 is shown how to proceed further on, slanting the metal its entire thickness on a smooth line by about $1/64$ of an inch, somewhat similar to a shear blade, though not as pronounced. The completed shearing edge should also resemble the blades on a squaring shear: there should be no more gap than the thickness of common writing paper between the two shearing edges; if the gap is wider the metal is liable to *bend* instead of parting. The *bevel* on the shearing edge should not terminate in a sharpness; rather, it should commence below the thickness of the metal worked; if it be the 18 gauge, then the bevel starts $1/16$ of an inch below the actual shearing edge. The sharpness of the edge is in this $1/16$ depth of the die-plate, with the surface of the die at the point running to the actual cutting edge.

Fabricating Furnace Fittings

In quantity production of such product as furnace fittings, for instance, fabricated of thin metal, plate dies operating in a suitable press are preferable to any other blanking means because the multiple direction and shape of the shear-lines and notches (as shown in Figures 3, 4 and 5), are cut in one operation. (A) In Fig. 3 is the body of a double register box (wall), and (B) fits into the corner at which commences the square pipe, forming the throat thereof. As shown in the drawing, (A) needs only forming into a "U", and (B) is flanged at the notches and braked in the middle into a rectangle. This is a spot-welded construction, the flanges of (B) spotwelding to the proper portions of the body (A). This (A) blank being of considerable length, the dies are mounted in the press lengthwise, with the pre-sheared sheets of metal each inserted into the dies separately, the sheet held in position by pins protruding from the plate, or, if preferable, holes may be drilled in the wasted margin of the sheet and held over pins placed in corresponding position in the plate. The (B-B) parts would be square sheared to a

long strip and fed into the dies as shown in Fig. 4, with the gaging holding the sides of the strip and two other pins gaging the distance to which to feed the sheet for the next operation. All such gaging pins need to protrude only about $1/4$ of an inch above the die-plate, except where the long sheet worked would be wavy, necessitating more pronounced gaging.

In Fig. 4, we show comparatively short blanks obtained by feeding a long sheet of metal, a strip sheared to a width fitting in-between the gaging pins (C-C) held in the support of plate (A). Distancing pins (E-E), similarly held in position in the support plate, engage one of the sheared edges (blanked out previously), and the best position for these pins is at the edge shown in the drawing, because if so posted the operator can push the sheet ahead instead of pushing it forward and then back again for the sheared edge to come against the (E-E) pins. In any small size blank processing through the press this strip-feeding method would be preferred because it is productive of quicker and more accurate results than if we square-sheared the sheet to the blank size and deposited it in the dies each individually. In Fig. 5, we see both the entire perimeter blanking and hole-blanking at the same time, with the upper die (A) having openings for disks secured to the lower die-plate, so that each die in this instance is in part male and in part female. It is obvious that the disks must be secured solidly in their proper positions to meet the openings in the upper plate (A) and admit of the two shear-edges to pass one the other snugly.

Securing Dies in Place

Inasmuch as any blanking by dies presents difficulties in the required correct placement of the reciprocating shearing edges of the dies; and in holding the dies in the proper position by bolts; the safest way of obtaining the accuracy of die-positioning and of shearing edge meeting location is to construct the dies as shown in Fig. 6. Here the upper die moves above the lower die on shafts, so that when the two shearing edges meet for cutting the sheet there can be no shifting of the one away from the other. The construction is, as shown, quite simple: (a) and (b) are steel plates (or castings) of sufficient thickness to hold the die-

(Please turn to page 172)

Design of Waste Removal Systems (Part III)

By H. M. Nichols
Industrial Dep't, Sturtevant Div.,
Westinghouse Electric Corp., Hyde Park, Mass.

These articles are adapted from a series of lectures that are presented in the Sales Engineering School of B. F. Sturtevant Co. Their application of basic principles is so sound as to be of value to any sheet metal contractor handling this type of work in any good volume.

THE design of systems for dust control is governed in most states by State Industrial Codes which have the force of law. New York state was a pioneer in this field and many of the state codes are patterned after the New York code, although in some of the states there is considerable variation from the New York code, especially, as to suction requirements at the hoods. In designing dust control systems the industrial code for the particular state involved should be followed.

In addition to detailed specifications covering grinding wheels and woodworking machines the New York code states that all machinery creating dust or impurities, shall be equipped with proper hoods and pipes connected to an exhaust fan of sufficient capacity and power to remove such dust or impurities. The New York code also states that if dust, gases, fumes, vapors, fibers, or other impurities are generated or released in the course of the business carried on in any workroom of a factory, in quantities tending to injure the health of the employees, suction devices shall be provided which shall remove such impurities from the workroom, at their point of origin where practicable, by means of proper hoods connected to conduits and exhaust fans. There are a wide variety of industrial dusts ranging in effect all the way from simple nuisances to serious health, fire, and explosion hazards.

Types of Dust

In the metal industry dust from foundry shakeouts and tumbling barrels is a serious problem. Billet grinding, snagging, buffing, polishing, brushing, and sand blasting as well as tool and other dry grindings, are all sources of harmful dusts.

The shoe industry has long been a large user of dust control systems. The most common applications have been on scourers, grinders, sanders, buffers, trimmers, and on last making operations. Fan systems are also indispensable in the hat industry with sizing and

pouncing rooms the chief dust control application. In the ceramic and plastic industries the principal applications are a variety of sand blasting operations employed in glass and pottery making. Finishing operations in the fast growing plastics industry present similar demands for dust control. In the textile industry the major applications of dust control are napping, shearing, and willowing. Modern woodworking machinery is a prolific producer of dust and shavings, sawing, planing, tenoning, sanding, and other shaping and surfacing operations all call for control systems.

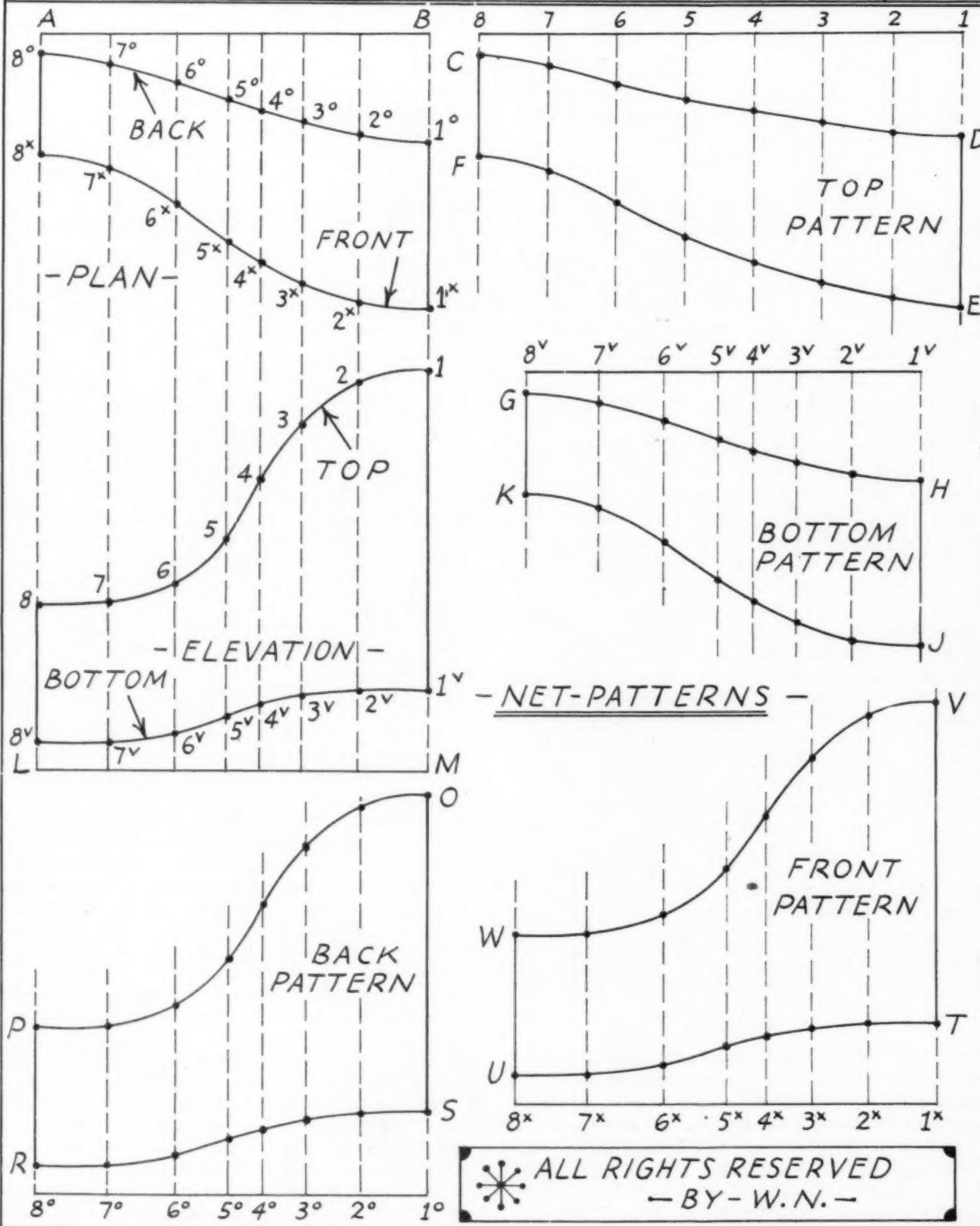
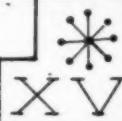
In the food industry dust control is essential in grain elevators, starch mills, and in the grinding of cocoa and spices. The necessity for dust control in these applications is not so much from a health standpoint as it is from the safety standpoint of the prevention of dust explosions. In the paint industry the handling of pigment in volume, usually involves a dust nuisance or hazard.

Mixing rolls in rubber mills are also a prolific source of dust. In the fuel industry the removal of dust at coal breakers includes the control at screens and cleaning tables, and in mechanical conveying and dumping operations at power plants. Other possible applications are found in roofing plants, in asbestos and stone plants, and in controlling rag dust in the paper industries.

Code specifications for grinding and buffing wheels are quite specific and outline the requirements in exact detail, while in the case of many other dust applications the codes confine themselves to requiring adequate dust control, leaving the details of the accomplishments to the resourcefulness and ingenuity of the designer. Where codes are involved, necessarily, the specific code requirements must be followed. However, where there is no applicable state code it is customary to follow the general plan of the New York code in the design of grinding wheel and dust control exhaust systems.

(Please turn to page 174)

— TRANSITIONAL — COMPOUND-OFFSET —
— IN-HEAVY-GAUGE-SHIP-VENTILATION —



Pattern Development for Heavy Gauge Blowpipe Fittings*

Transitional Compound Offset

By William Neubecker

A CORRESPONDENT from Pascagoula, Miss. desires information on developing a transitional compound offset, used in heavy gauge ventilation work. A reduced reproduction of his drawing is shown in the plan and elevation on the full page drawing No. XV. The various curves in the plan and elevation indicate the amount of offset that was required to pass under or over the various steam and other pipes. The problem presented appears complicated; but in view of the fact that it can be solved by using the parallel line method of development, it becomes simple and interesting.

Draw Plan and Elevation

The first step is to draw the plan and elevation in their proper relative positions as shown. The second step is to space one of the profiles in either plan or elevation in an *equal number of divisions*, (in this case the profile in elevation marked TOP) as shown by the figures 1 to 8. Through these points of intersections draw perpendicular lines to intersect the bottom profile in elevation from 1° to 8°, also the back profile in plan from 1° to 8° and the front profile in plan from 1° to 8° which makes all of the divisions in the three profiles above mentioned *unequal* and requires that each space or division must be measured separately when developing the pattern shapes. Now draw a horizontal measuring line near the back profile 1°-8° in plan as shown by A-B and another measuring line near the bottom profile in elevation as shown by L-M.

Evolution of Pattern

Developing the patterns is now in order. To obtain the pattern for the top of the transition take the stretchout of the top profile 1 to 8 in elevation (each space or division being equal) and place them on the horizontal stretchout line 1 to 8 at the upper right. From these divisions at right angles to 1-8 draw lines indefinitely. Now measuring from the line A-B above the plan, take the various distances to points 1° to 8° in the back profile and place them on similar numbered lines in the top pattern measuring in each and every instance from the stretchout line 1-8. Through points of intersection so obtained draw the curve C-D. Again measuring from the line A-B in plan take the various distances to points 1° to 8° in the front profile and place them on similar numbered lines in the top pattern measuring in each instance from the stretchout line 1-8. Through points of intersection so obtained, draw the curve E-F. Then will C-D-E-F be the net pattern

shape for the top of the transition shown in elevation. For the pattern for the bottom of the transition take the stretchout of the bottom profile 1° to 8° in elevation (being careful to measure each space separately as they are all unequal) and place them on the horizontal stretchout line 1° to 8° at the center right. From these points at right angles to 1°-8° draw line indefinitely. Now measuring from the line A-B in plan, take the various distances to points 1° to 8° on the back profile and place them on similar numbered lines in the bottom pattern, as shown. Through points of intersection so obtained draw the curve G-H.

Again measuring from the line A-B in plan, take the various distances to points 1° to 8° on the front profile and place them on the vertical lines drawn from similar numbered lines in the bottom pattern as shown. Through points of intersections so obtained draw the curve J-K. Then will G-H-J-K be the net pattern shape for the bottom of the transition shown in elevation. For the pattern for the back of the transition take the stretchout of the back profile 1° to 8° in plan, (being careful to measure each space separately as they are all unequal) and place them on the horizontal stretchout line 1° to 8° at the lower left. From these points at right angles to 1°-8° draw lines indefinitely as shown.

Now measuring from the line L-M in elevation take the various distances to points 1° to 8° and place them on the vertical lines drawn from similar numbers in the back pattern, measuring in each instance from the line 1°-8°. Through intersection points so obtained trace the curve R-S. Again measuring from the line L-M in elevation take the various distances to points 1 to 8 and place them on the vertical lines drawn from similar numbers in the back pattern, always measuring the line 1°-8°. Through the intersections so obtained trace the curve O-P. Then will O-P-R-S be the net pattern for the back of transition shown in plan.

For the pattern for the front of the transition, take the stretchout from 1° to 8° in plan and place them on the horizontal line 1° to 8° at the lower right and from these points, at right angles to 1°-8° draw lines indefinitely. Now measuring from the line L-M in elevation take the various distances to points 1° to 8° at bottom also to points 1 to 8 at top and place them in the front pattern on similar numbered lines always measuring from the stretchout line 1°-8° in front pattern. Through points of intersections so obtained trace the curves T-U and V-W respectively. Then will T-U-V-W be the net pattern for the front of the transition offset.

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The Idea Exchange { Send Us Yours! }



Metal tabs attached to stainless steel section.

Seam Welding Aid

THE addition of a small piece of metal to serve as a tab on welded seams at the Ryan Aeronautical Company has resulted in more perfect welds.

In order to obtain large cylindrical sections of stainless steel, the flat sheets are formed and welded by the metallic arc method. Usually this welding produces a defect, in the form of a notch, at the beginning and end of the weld seam. The heat from the welding process is conducted away from the weld zone by the surrounding metal. As the arc approaches the edge of the part there is an increase in temperature which occurs because of the decrease in area of heat-conducting metal. This temperature rise causes a small amount of metal to melt out and leave a notch at the seam edge. When the part is bent it will usually split at this point.

A Ryan employee, H. A. Faris, solved this troublesome problem by adding a small metal tab at each end of the proposed weld seam. The tab may be tack-welded on. Then the heat is evenly distributed for the whole length of the weld and the notch occurs at the edge of the tab where its appearance is of no consequence. The tabs are trimmed off with a saw or nibbler to complete the operation.—W. P. Brotherton, Ryan Aeronautical Co.

If you have a time or money saving idea in use in your shop, write us about it. If acceptable, it will be published and regular manuscript rates paid. Pictures add interest to such items.

Corner Rounding

CONSIDERABLE sum can be saved by sheet metal contractors having to make up cabinet or other sheet metal siding with rounded corners through the use of a simple jig as here seen in use in the plant of Faron Sheet Metal Contractors, Jersey City, N.J. This

craftsman, as part of his normal business of fabricating refrigerated food containers of stainless steel, has to provide rounded corners. Radii may be any desired length by changing the size of the pile over which the sheeting is bent. Such radii, again, may be at any desired distance from sheet edges by changing the limit gages placed behind the roller.

Radius of the sheet after bending is the same as the radius of the pipe used as the backer. So that pipes can be changed, their ends fit into brackets much like toilet paper supports. Behind the roller, or pipe, are attached to the bench or jig support two mathematically correct lugs that require the finished sheet radii to be accurately placed. A check on this accompanies marking on the sheet blank the correct points for making the bend, then lining these up with roller marks.

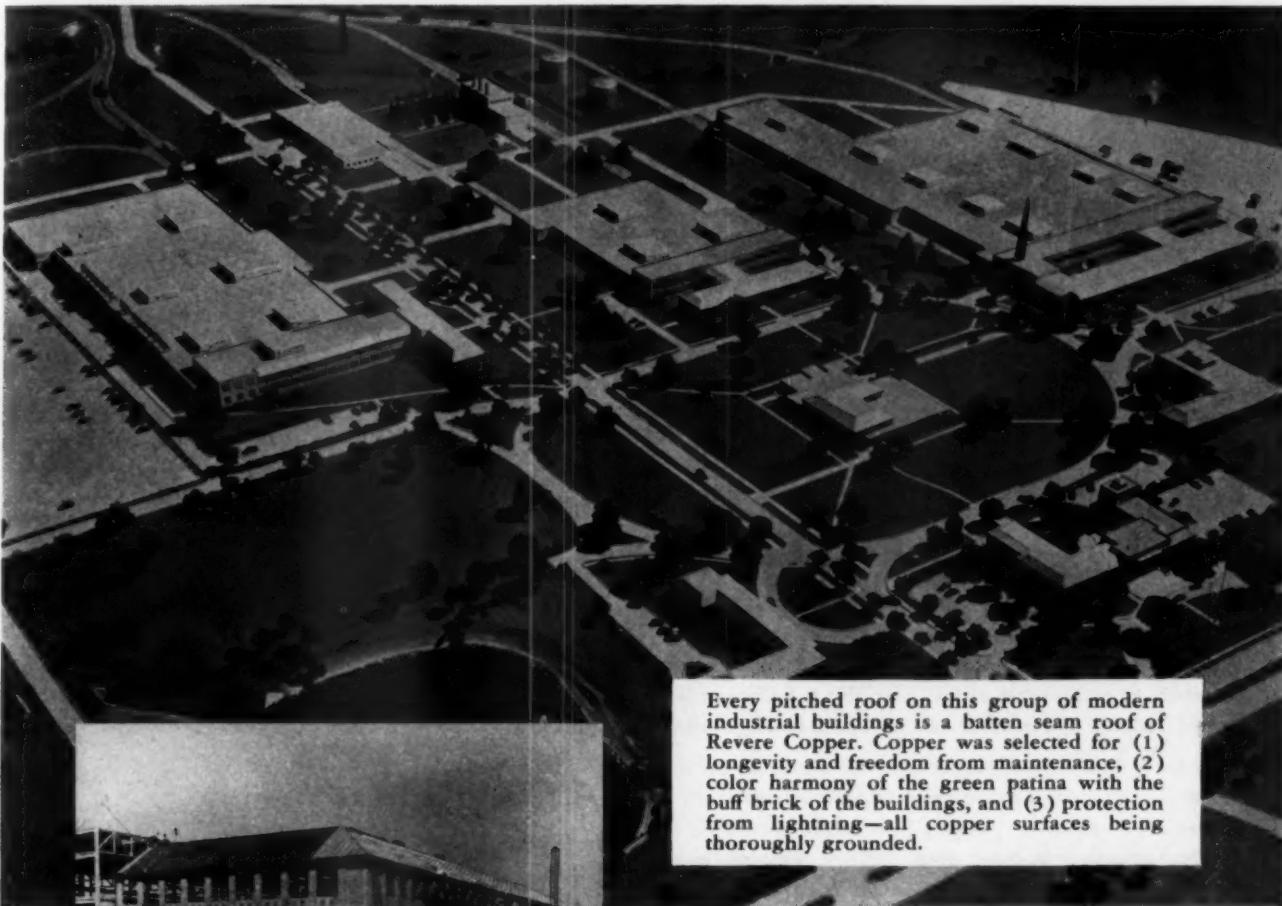
Having placed the raw sheet behind the roller, two mechanics then bend the sheet over the roller, usually at 90 deg. for cabinets, rubber mallet it into position so that when it is released it does not spring back. Time required to make such rounded corners, in contrast to forming them on a press brake, is much less, it was found, though the brake was suggested as an improvement when 50 or more sheets had to be processed at a time. But for fewer than this number the Faron jig outstripped the larger machine considerably.—R. C. Nason, Long Island, N. Y.

The corner rounding jig in action.



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*Revere's manual of sheet copper construction, "Copper and Common Sense," contains 96 pages of important new facts which enable you to design or install copper roofs, gutter linings and flashings that give *extra* years of service. It has been widely distributed to architects and sheet metal contractors and should be in your office files. In all matters of sheet copper construction, it will pay to turn to this manual first.

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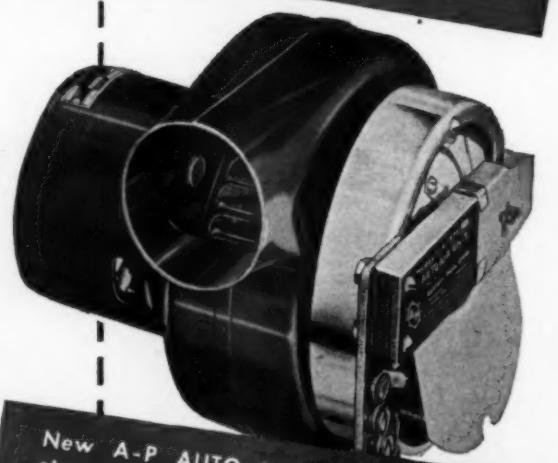


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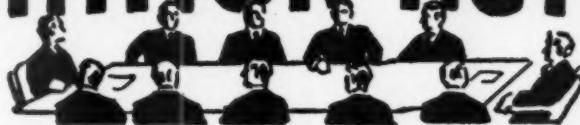


New UNAPAC showing streamlined design, and also with cover removed to show Oil Safety Control, Electric "Auto-Heat" Top and wiring for complete furnace control including AUTO-AIR Draft Control.



New A-P AUTO-AIR Unit, mounted on standard booster fan, regulates air input for all burner positions.

ASSOCIATION ACTIVITIES



SMCNA's New Headquarters

THE address of the national office of the Sheet Metal Contractors' National Association, Inc., is now Suite 27, 170 Division Street, Elgin, Illinois—J. D. Wilder, Executive Secretary. Elgin is about 40 miles from Chicago, and about 70 minutes by train.

President Walsh met with officers and directors, key committeemen, key men from Chicago and nearby, on the afternoon of September 5. The immediate long range program was presented, discussed and approved.

President Walsh and Executive Secretary Wilder attended and addressed a dinner meeting of the Lake County (Indiana) Sheet Metal Contractors Association



J. D. Wilder, former editor of American Artisan, and now Executive Secretary of Sheet Metal Contractors' National Association, Inc.

on September 5. President Walsh reported on the accomplishments—Labor Relations, Apprentice Training, Bookkeeping, and the new National office with a full-time secretary. A standard form of uniform agreement looks highly probable, the apprentice program is ready to mail and put in action; a reasonably priced bookkeeping system is available.

Secretary Wilder presented plans of the National to be a "clearing house"—making studies of pressing problems. Among the subjects planned for study are methods of using aluminum with cost data; status of "firm prices;" incentives and bonus plans; the five-day week; overhead; labor agreements and relations; labor efficiency; heating codes and ordinances. Plans are also ready for "Technical Bulletins" such as Warm Air Panel Heating and Five-step Method of Balancing Automatically Fired Heating Plants. He described the plans of the Trade Relations, Warm Air Heating, and Membership committees.

Committees, Chairmen, Co-Chairmen

Major committees have been set up to function for the coming year, as follows:

MEMBERSHIP COMMITTEE

Chairman—H. J. Orton, Orton Heating Company
50 E. Springfield Road, Barberton, Ohio
Co-chairman—C. J. Meyer, Joseph Meyer & Son, Inc.
569 Genesee Street, Buffalo 4, New York

LABOR RELATIONS COMMITTEE

Honorary Chairman—Louis L. Narowetz, Narowetz Heating & Ventilating Co.,
1722 Washington Blvd., Chicago 12, Illinois
Chairman—Roy H. Dose, Roofings, Inc.
266 Walnut Street, St. Paul 2, Minnesota

APPRENTICE TRAINING COMMITTEE

Chairman—Frank Kramer, Kramer Sheet Metal Works
3145 South K.K. Avenue, Milwaukee 7, Wisconsin
Co-Chairman—H. R. Bostrom, Bostrom Sheet Metal Works
1509 Marshall Avenue, St. Paul 4, Minnesota

WARM AIR HEATING COMMITTEE

Chairman—W. J. Keist, W. J. Keist & Son
322 Perryville Road, Pittsburgh 29, Pennsylvania
Co-Chairman—E. H. Gundling, Hawkeye Tin Shop
211 First Ave., S. E., Cedar Rapids, Iowa

COMMERCIAL AIR CONDITIONING COMMITTEE

Chairman—Norman B. Fisher, Liberty Engineering & Mfg. Co.
1450 South 15th Street, Louisville 1, Kentucky
Co-chairman—Walker Jamar, Walker Jamar Company
365 South 1st Avenue, Duluth 2, Minnesota

BOOKKEEPING COMMITTEE

Chairman—C. F. Warning, Warning Sheet Metal Company
67 Ceape Street, Oshkosh, Wisconsin
Co-chairman—C. M. Gundlach, Gundlach Sheet Metal Works
910 Columbus Avenue, Sandusky, Ohio

TRADE RELATIONS COMMITTEE

Chairman—E. B. Brown, Jr., Reynolds Corp.
4228 S. Lowe Avenue, Chicago 9, Illinois
Co-chairman—P. S. Varden, Varden Bros. Roofing Co.
P.O. Box 566, Albany 1, New York

Tentative programs for these committees have been prepared.

Two committees have yet to be completed, the Roofing Committee and Sheet Metal Manufacturing Committee. The makeup of the committees has been determined, but consent of chairmen has not been secured.

Dayton, Ohio

THE members of the Dayton Master Sheet Metal Furnace and Roofers Association, the allied sheet metal industries, salesmen and their families, enjoyed their annual family picnic on Thursday afternoon and evening, August 14th, at McCrabb's Beechwood Park grove.

Over two hundred fifty men, women and children enjoyed this annual outing. Games and refreshments were provided in abundance. At 6:30 a delicious chicken dinner was served with plenty of corn on the cob.

Twenty-five silver dollars were the prizes handed out to those holding the lucky numbers.

In the evening motion pictures were shown—"Call of the Wilderness," "Mickey's Rescue," and "Big Bad Wolf."

The entertainment committee: V. J. Wehner, chairman, Al. J. Hoersting, George Brake.—A. J. Hoke, Secy.-Treas.

Association Activities . . .

Jurisdiction—

Engineering—

Trade Relations

LOUIS L. NAROWETZ, Narowetz Heating & Ventilating Company, Chicago, addressed the Milwaukee Sheet Metal Contractors' Association on September 9, speaking as a member of the Labor Relations Committee of the Sheet Metal Contractors' National Association, Inc., and as a sheet metal contractor. His talk touched upon trade jurisdiction, engineering by contractors, trade relations, and modern tools to meet competition.

Highlights of his talk follow:

Trade Jurisdiction

Trade jurisdiction is the life-blood of our trade and requires the co-operation of our contractors with labor in their fight to maintain our rights to fabricate, assemble and erect all classes of sheet metal work made of No. 10 gauge and lighter.

Our union has a charter from the American Federation of Labor which gives to labor the sole jurisdiction over the above classes of work, and includes the erection of fans, filters, air washers, ventilating units, warm air heating, copper work and many other items which go into the makeup of the air moving end of heating, ventilating and air conditioning, as well as general sheet metal work.

Much of our trouble comes from specifications as written by the consulting engineer, trying to have one contractor responsible for his layout, and unfortunately for us in the past, the sheet metal contractor had been unqualified to take an entire contract, even though he could have sublet the heating and cooling cycle as the piping contractor would sublet the air moving cycle.

In the last few years, a great deal of progress had been made to the end that engineers do consider air conditioning as a two-trade jurisdiction and as having three phases, namely:

- 1.—Heating, including the boiler; radiation and air heating coils; and piping, purely a steamfitter's work.
- 2.—The Cooling Cycle, to include compressor, cooling coils, piping and condenser, this cycle also being conceded to the piping contractor.
- 3.—After the above two phases are developed, engineered and specified, the major part of the system leaves to sheet metal contractors what I like to call the air moving end of the job, which includes fans, motors, starters, drives, filters, precipitrons, airwashers, activators, automatic dampers, intakes, discharges, duct systems, apparatus housings, grilles, outlets, etc.

Any competent consulting engineer who does not write independent specifications so that the piping contractor can figure on the heating separately with

his option to also figure on the cooling cycle, is doing a disservice to his client. If he writes independent specifications for the pipe trades and concludes his work with a separate specification for the ventilation or air moving end, the fact that they are separated saves the owner whatever carrying charge the piping contractor elected to add to our work. This is doubly unfair to the owner, now that our end of such jobs is equal to the combined heating and cooling. It is the duty of our contractors to insist on these divided specifications and to qualify to offer bids and take contracts as ventilating contractors; and in this way purchase the equipment so that they may have sheet metal workers in their employ handle and erect the component parts of an air conditioning system.

This gives our labor the chance to handle what is within their jurisdiction and since possession is said to be nine-tenths of the law, contractors would be doing their part to help labor in their fight to preserve the mutual and vital interest of both in the sheet metal industry.

Engineering and Trade Relations

Mr. Narowetz believes contractors should support consulting engineers in their work and in turn expect co-operation from them in connection with air conditioning work. Chicago contractors are in joint session each month with the local engineers' society and are making progress toward the separation of work, to include the heating and cooling cycle in the pipe trade specifications, and finally the ventilation or air moving end, which after all is the medium of exchange for heat transfer or absorption, in sheet metal contractor specifications.

In order to make this a universal practice, contractors must be capable of bidding for and qualified to install the work. With separate specifications, contractors will purchase the fan, filters and damper sections of the ventilating units; and the pipefitter can buy the heating and cooling coil sections. Many manufacturers are striving to ship the coils separately if contractors let them know labor wishes to avoid jurisdictional strife. Under this procedure, contractors will purchase all ventilating equipment and become full-fledged contractors instead of labor brokers furnishing the most unpredictable item in their estimate.

Modern Tools

Increased rates of pay granted plus fringes allowed add to the cost of doing business. Items like travel time, putting in less hours than they are paid for in the field, a foreman for a small number of journeymen, restrictions on apprentices, increased pressure for so-called welfare funds, and vacations with pay . . . are all innovations left with us by social progress speeded up because of World War II.

Mr. Narowetz is not opposed to all of these innovations, but emphasized that contractors who pay out wages must realize that these items have increased the cost of work far beyond the actual increase in wages demanded by labor.

As national economy comes nearer to balance, supply and demand will again cause whatever is unfair or

(Continued on Page 118)



"The Sun Never Sets with MOR-SUN"



No wonder... **MOR-SUN is No. 1** on the Heat Parade

The 100% die-pressed Mor-Sun furnace, a unit of modern design, mass produced in the modern Morrison plant, offers economy of first cost and operation — PLUS beauty!

No wonder Mor-Sun is specified for replacement, modernization and for new construction . . . specified for single homes as well as projects of thousands of homes! No wonder Mor-Sun is **NO. 1 ON THE HEAT PARADE!**

SHEET METAL CONTRACTOR . . . "Mor-Sun comes in an assembled package, ready to set up. That saves me money. And sales appeal! The streamlined Mor-Sun casing makes it easy to convince the home owner that he is getting a truly modern piece of equipment. And it's easy to explain to anyone why the Mor-Sun heat exchanger gives long life and economy. The whole unit is clean, simple, and it looks like a manufactured product."

HEATING ENGINEER . . . "Mor-Sun engineers have come up with a really modern heat exchanger. Noisy baffles, dirty radiators, and gaskets have been eliminated. There is no counter-flow; therefore no draft problem. The Mor-Sun is rugged and efficient."

SERVICEMAN . . . "Mor-Sun has good burners and controls, but, further than that, Mor-Sun has construction features that reduce possibility of burner failure."

HOME OWNERS . . . "We wanted a playroom in our basement but we were worried about how we could hide or camouflage the furnace. One look at the Mor-Sun — and our problem was solved! It was an added pleasure to learn from a neighbor that the Mor-Sun, in addition to being beautiful, quiet and economical—is within our budget."



To the introduction of
post-war MORRISON
Pre-pressed Steel Furnace . . .
completely new from stem
to stem . . . it has zoomed
in universal popularity . . .
POPULARITY THAT HAS
EARNED IT

MORRISON
STEEL PRODUCTS, INC.
BUFFALO 7, N. Y.

Association Activities . . .

NWAH&ACA ANNUAL

THE 34th annual convention of the National Warm Air Heating and Air Conditioning Association is being held at the Hotel Cleveland, Cleveland, Ohio, on December 4 and 5.

President Frank E. Mehrings announces the following program has been arranged by a program committee consisting of Gene Brown, chairman, E. P. Hayes, M. I. Levy, H. L. Orton, I. L. Seith and H. S. Sharp:

Thursday, December 4

(Registration 9:00 to 9:45 A. M.)
Mezzanine Floor

Ballroom

F. E. Mehrings, presiding
Announcements

9:45 A. M. President's opening talk—F. E. Mehrings

Research Progress—F. L. Meyer
Chairman, Research Advisory Committee

Installation Codes—W. D. Redrup
Chairman, Installation Codes Committee and Application Engineering Advisory Committee

Michigan State College Short Course
Professor Lorin G. Miller, Chairman
Technical Education Committee

"Extended Plenum Duct Systems"—S. Konzo
Professor of Mechanical Engineering, University of Illinois

"Measuring Performance of a Blower in a High-Boy Furnace"—N. A. Buckley, Special Research Assistant, University of Illinois

Adjournment

Luncheon 12:30 P.M.
Red Room

Afternoon Session

Ballroom

Atlee Wise, presiding

2:15 P. M. Election of Officers and Members Board of Directors

"Panel Heating in the New Research Residence"—R. W. Roose, Special Research Assistant, University of Illinois

Report on Indoor Comfort Conferences—G. A. Voorhees, Application Engineering Director

Talk on Sales by Gene Brown, Sales Manager, Morrison Steel Products, Inc.

Benefits of "Continuous Air Circulation"—John W. Norris, Vice President, Lennox Furnace Company

Adjournment

Cocktails 5:00 P.M.
Red Room

Friday, December 5

Ballroom

C. S. Franke, presiding

Fuel Forum

9:45 A. M. Representing the Bituminous Coal Industry—J. Nelson Stuart, Manager, Coal Heating Service Division, National Coal Association

Representing the Oil Industry—Robert Gray, Business Manager, Fueloil & Oil Heat

Representing the Piped Gas Industry—Leigh Whitelaw, Managing Director, Gas Appliance Manufacturers Association

Representing the Liquefied Petroleum Gas Industry—Harold D. White, Executive Vice President, Liquefied Petroleum Gas Association, Inc.

Adjournment

Luncheon 12:30 P.M.
Red Room

Barton Rees Pogue—Guest Speaker
Luncheon to be adjourned at 2:00 P.M.

There will be no afternoon program, thereby permitting convention guests to meet with their friends and business acquaintances.

The program is backed up by splendid facilities arranged by the Cleveland convention Committee of which M. I. Levy is chairman and Frank Gibbons co-chairman.

The Association extends a very cordial invitation to all manufacturers, wholesalers and dealers in the warm air heating industry to attend this 34th annual convention. You will get the answers to what the fuel producers are doing and planning. Each speaker on the "Fuel Forum" is outstanding in his respective industry. You will learn why it is good business to promote "Continuous Air Circulation" and all the other advantages inherent in a forced warm air heating system.

The report on "Panel Heating in the New Warm Air Research Residence" is something the entire industry is waiting for. According to present plans, the new Manual on Radiant Panel Warm Air Ceiling Heating Systems will be made available by the time of the convention.

If you have not made hotel reservations, do so at once. Write Hotel Cleveland, Cleveland, Ohio, advising the date and approximate time of arrival and departure.

Registration fee per person for non-member guests is \$5.00 for dealers, \$10.00 for wholesalers and \$15.00 for manufacturers.—George Boeddener, Man. Dir., 145 Public Square Building, Cleveland 14.

Coming Conventions

1947

Dec. 3—National Heating Wholesalers Association. First Annual. Hotel Cleveland, Cleveland. E. J. Eckstein, Secy.-Treas., 526 Galveston Avenue, N. S., Pittsburgh 12.

Dec. 4-5—National Warm Air Heating and Air Conditioning Association. 34th Annual. Hotel Cleveland, Cleveland, Ohio. Geo. Boeddener, Man. Dir., 145 Public Sq. Bldg., Cleveland 14.

Dec. 8-10—The American Society of Refrigeration Engineers. 43rd Annual. Hotel Traymore, Atlantic City. R. H. Money, Pres., 40 W. 40th St., New York 18.

1948

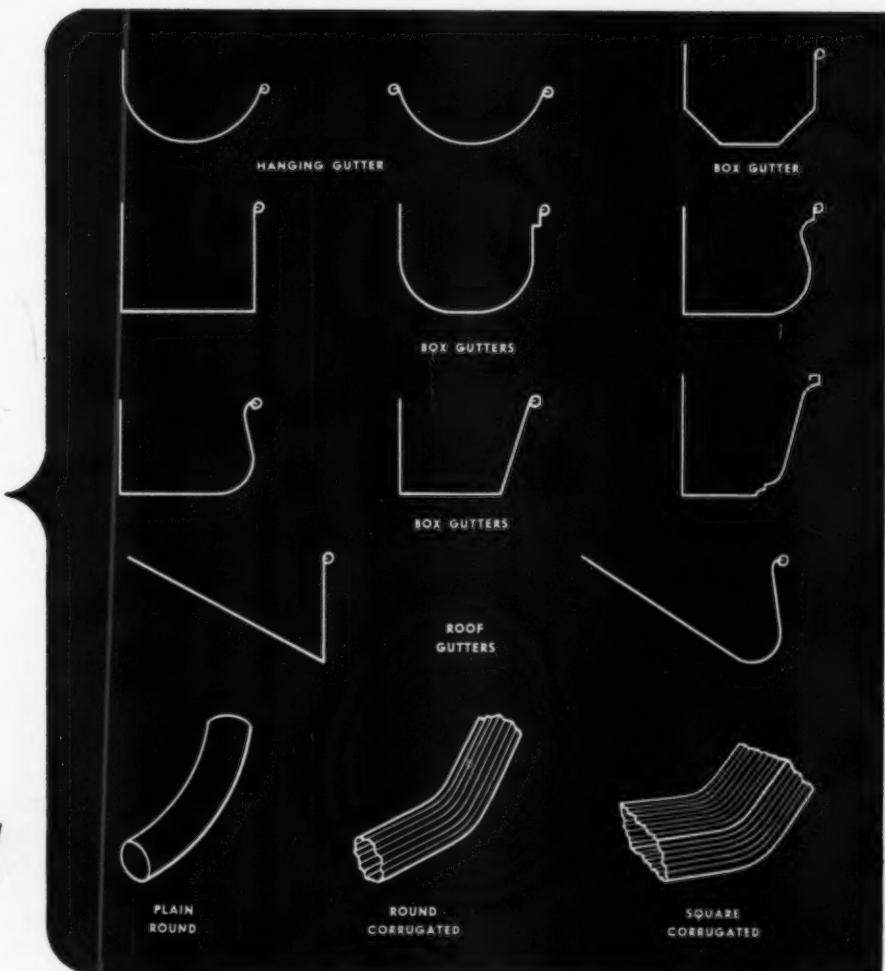
Jan. 26-29—Air Conditioning Exposition. Refrigeration Equipment Manufacturers Association, Cleveland Auditorium, Cleveland.

Feb. 2-6—Seventh International Heating and Ventilating Exposition. Grand Central Palace, New York City.

Feb. 5-6—Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Inc. 30th Annual. Hotel Severin, Indianapolis. Frank E. Anderson, Sec'y., 439 S. 17th St., Terre Haute.

Feb. 8-11—Sheet Metal Contractors' Association of Wisconsin, Inc. 33rd Annual. Schroeder Hotel, Milwaukee. Paul L. Biersach, Sec'y., 225 E. Michigan St., Milwaukee 2.

HERE'S
A REAL
OPPORTUNITY



for contractors who want to make more money and better satisfy customers

IT'S BACK AGAIN—ARMCO Stainless Steel for profitable roof drainage jobs—and hundreds of sheet metal contractors will welcome it!

Here is the metal that has everything it takes for *quality* roof drainage. It is rustless and lasts as long as the house itself. Its soft silvery luster blends well with any color scheme or style of architecture. Pound for pound it is much stronger than any other metal used for roof drainage. When properly installed, an ARMCO Stainless system won't buckle under heavy loads of ice and snow and doesn't crack with sharp changes in temperature. It also will not stain adjacent surfaces.

Workability is good. No. 28-gage ARMCO 17-7 Stainless (Type 301) forms as readily as 26-gage galvanized steel. No special equipment is needed.

As for cost, you can tell your customers that ARMCO Stainless, with all its advantages, *actually*

costs less than any other top-quality material ordinarily used for this purpose.

Your extra profit comes from selling a better grade job. It will also pay off in customer satisfaction and more orders from word-of-mouth advertising.

Write for a free copy of "ARMCO Stainless Steel for Gutters, Conductor Pipe and Accessories," and the name of your nearest supplier. The American Rolling Mill Company, 401 Curtis Street, Middletown, Ohio. Export: The Armco International Corporation.

* * *

TURN IN YOUR SCRAP NOW—HELP MAKE MORE STEEL

Scrap piles in most steel mills are critically low. Unless this shortage is relieved, everybody must wait longer for steel. You can help. Collect all the steel scrap you can find and speed it through regular channels to the mills. Remember—*more scrap means more steel, sooner.*



THE AMERICAN ROLLING MILL COMPANY

• SPECIAL-PURPOSE SHEET STEELS • STAINLESS STEEL SHEETS, STRIP, BARS AND WIRE

Association Activities . . .

Canadian NWAH & ACA

THE Canadian Chapter of the National Warm Air Heating and Air Conditioning Association announces that its fourth annual meeting will be held Friday, December 12, 1947, at the Chateau Frontenac, Quebec City. This will be an all-day general meeting and will be open to members, associate members and the press, with the trade papers, particularly, being invited to attend.

The guest speaker is to be Professor E. A. Allcut, head of the Department of Mechanical Engineering at the University of Toronto.

The fiscal year ended September 30th. An invitation was mailed to non-members throughout Canada inviting them to become associate members. Of a total of 42 jobbers throughout Canada in the warm air heating industry, 11 are associate members. Of some 2,700 warm air heating contractors, 342 are associate members, or almost 13 percent.

New Member Committee

The Constitution and By-Laws of this association requires that the Technical Advisory Committee (formerly the Engineering Committee) be comprised of 5 members. For over a year now this committee has been operating with 4 members. During early September the Board of Directors, upon recommendation of the Technical Advisory Committee, appointed George E. Pallister as the fifth member. The appointment is an annual one, reappointment by the board at the December meeting being necessary. Mr. Pallister is the sales engineer of one of our manufacturer members and has had over twenty years experience in the warm air heating industry.

Technical Advisory Committee

On September 17, 18 and 19 the Technical Advisory Committee met in Toronto. At this meeting four representatives from the engineering staff of four manufacturer members were in attendance to gain knowledge of the working machinery of the Technical Advisory Committee and to gain first-hand knowledge as to the requirements and methods for carrying out a successful school program. The highlights of the meeting may be presented as follows:

1. Provision for the limited use of double headers on the ground floor has been recommended for inclusion in the gravity code and manual.
2. The release of the classroom edition of Manual No. 9 with corrections and additions thereto, has been authorized. Manual No. 9, designed for forced air heating systems, having a heat loss in excess of 120,000 Btus per hour, has been prepared to replace the Technical Code. Three work sheets are necessary in using Manual No. 9—first form No. 9-A, which is used exclusively for heat loss calculations; Form 9-B for warm air branch, stack, and register sizing and return air branch, stack, and intake sizing; form 9-C for trunk duct sizing, warm air trunks and trunk duct sizing, return air trunks.

Manual No. 9 has been laid out for the practical heating designer and when one gains sufficient experience in its appli-

cation, warm air heating installations greater than the scope of those covered by Manual No. 7 may be designed both quickly and reliably.

2. The Technical Advisory Committee has recommended to the Managing Director that he consider the advisability of extending the present four-day school program to include five days, in order that more time will be available for the numerous subjects and classroom work included in the syllabus. This office would appreciate the submission of comments from associate members as to this contemplated change.

Wholesalers Plan Convention

THE National Heating Wholesalers Association, established on January 25, 1947, by an interested group of the leading heating wholesalers throughout the country, in response to a growing demand from the industry for such an organization to represent and promote its interests, announces that as of September 1st it has retained the services of Hunter-Thomas, Associates, trade association administrators, as executive-secretary.

Business offices have been opened at 2130 Keith Building, Cleveland, and a permanent, full-time representative, Richard M. Colegrove of the Hunter-Thomas staff, has been assigned to administer the affairs of the association at the direction of the board of directors and a specially appointed executive committee.

An active program designed to improve the position of the heating wholesaler in the local and national economy has been planned for the year. First on the agenda is a membership campaign to give the group additional strength. Following the inauguration of the campaign, the association will hold its first annual convention at the Hotel Cleveland, Cleveland, on Wednesday, December 3, 1947, one day prior to the annual convention of the National Warm Air Heating and Air Conditioning Association.

Plans for the convention include discussions by leading speakers drawn from the heating industry and the business world on such pertinent subjects as Merchandising, Dealer-Wholesaler Relationships, and Manufacturer-Wholesaler Relationships. Also featured will be short talks on Laws Affecting Business Operation, and Plans for Exchange of Local Credit Information, for Interchange of Inventory, and for Educational and Training Programs, to be followed by an open forum discussion of the problems of the heating wholesaler.

The convention will be the inaugural of an active year in which the association hopes to establish vigorous regional chapters to solve local problems on a local basis and to facilitate the operation of the national program for Inventory Interchange, Credit Information Exchange, Publicity on Legislation applicable to the industry and laws affecting business operation, aiding in the promoting of standardization and simplification of the products of the industry, the institution of training in salesmanship and merchandising, bookkeeping and business management, and the provision of advertising assistance to wholesalers and their dealers.

Plans are also being made to include research and assistance to wholesalers in the problem of stabilizing business operation throughout the year to eliminate seasonal declines.

Every heating wholesaler should attend the convention and get himself and the Association off to a good start for 1948.

60 days from now

There will be revealed to you an electrifying new development in the evaporative cooling field.

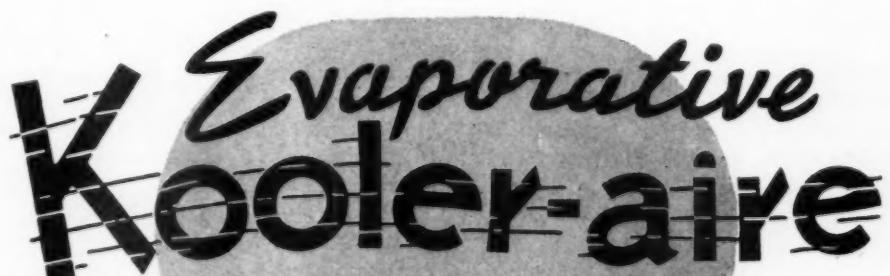
From the engineering staff that developed the mighty magic of the Gyro-Spray method of water application—

the V-type cooling mats with Labyrinth seal—the Deflecto Grille which gives complete control over the distribution of air comes the new features of the 1948

Evaporative Kooler-aire.

This Magic Worker in low-cost comfort cooling gives you Better Performance to offer your customers, Bigger Values to do business with—more profits for you. Hold everything for the 1948 Evaporative Kooler-aire.

UNITED STATES AIR CONDITIONING CORPORATION
Como Ave. S.E. at 33rd, Minneapolis, Minnesota

The logo features the words "Evaporative" and "Kooler-aire" in a stylized, flowing script font. The "K" in "Kooler-aire" is partially obscured by a series of horizontal lines, suggesting a grid or a series of spray nozzles. The entire logo is set against a light gray circular background.

THE MAGIC WORKER IN LOW COST COMFORT COOLING

Association Activities . . .

Detroit Plus Michigan

THE regular monthly meeting of the Detroit Warm Air Heating and Air Conditioning Contractors was held October 9th, at the Fort Shelby Hotel, with good attendance. The minutes of the previous meeting were approved as read.

After the treasurer's report there were very favorable comments on the golf party given at Gowonie Golf Club, sponsored by Joe McLaughlin of the Superior Safety Furnace Company. For his hospitality a rising vote of thanks was extended.

The question came up again regarding the city gas ordinance covering the installation of conversion gas burners. We understand that the plumbers' association does not like this ordinance and has filed an appearance in court for a hearing. Our Association has appointed a committee consisting of President Marshall VanAssche, Secretary Jay Biddle, W. O. Smith, and Bob Look. They will be on hand at the hearing in the event that their services are needed.

The secretary informed the meeting that Bill Pink who was secretary of the State Association had resigned. At a meeting of the State association directors, Jim Neil was elected for that position, to take office on October 15th. Ernie Simons told the assembly that all the jobbers would help Jim to the best of their ability.

A motion was made and carried to admit W. A. White and R. K. Zanetti as new members.

The president reported that the FHA would no longer approve oil burning installations in this territory unless the owners have an oil contract assuring them of a supply of fuel oil.

It was stressed that all members going to the national convention at Cleveland in December make hotel reservations as early as possible.

Members were told to study a report by Professor Miller on radiant heating.

A motion was made by Bob Clark that the members send in the number of their employees so that the Association could find out just how many men are in the employ of the members. This was seconded and members agreed to comply as early as possible.

Refreshments were supplied by the Detroit Furnace and Stove Company, Ernie Simons presiding.

Member News

Art Hutchison reports he has a nice job of installing sheet metal work on eighty homes.

Fred Bishop made one of his few appearances and reported he would be on hand at election time.

Ray Zick is now turning out a large number of blowers and will be able to sell some in the very near future.

Dewey Long said that the oil burner pump situation is now improving.

Joe Grady of Grady Roofing had some long stories to tell of the times when he was in Texas.

Don Southerland was at the meeting after a long sojourn at Lexington, Kentucky.

Jerry Beecraft was on the job as usual and says his business is quite good.



Left: Jay Biddle, E. A. Simons, Joe McLaughlin, Bill Vernier—at the Gowonie Golf Meet.
Right: Jim Neal, new State secretary.

Marshall VanAssche is remodeling a summer cottage on Lake Erie in Canada.

Otto Shultz took some very fine pictures of the shindig at the golf meet.

Midland Heating Specialties report that they are the sole distributors for the Hart line of heating equipment in the State of Michigan.—W. O. Smith.

Carolinas

THE October issue of "The Carolinas Roofer" calls attention to an interesting talk in Greenville some weeks ago by Bob Cooper of the Research and Planning Bureau of South Carolina. A point of interest which was brought out was a statement that the Carolinas greatest asset was their young men and women, and lists a number of sons who are in the roofing and sheet metal industry: Joe and Sam Piper, and Vardry and Jack Ramseur in Greenville; Bill Arthur and his brother in Asheville; Pickens Brothers in Spartanburg; Roy Martin, Jr., of Anderson; Hartin Jr. of Columbia; Spell of Charleston; Baker of Raleigh; the Shuman's of Charlotte; Walter Budd, Jr. of Durham; and then there are the three Bell sons; the Josh Ware's twins; and Kyle's son of Fayetteville.

J. Victor King of Sanford, N. C., was a representative of the building trades at the July meeting of the North Carolina Chapter of the American Institute of Architects at Moorhead City, N. C.

The Buyers' Guide in the October issue is referred to as the *white* market. During the period of the black market, and now the gray market, the listed concerns have given the dealers what they wanted or needed, divided what they received among their old customers, probably based on an allotment arrived at by the amount of materials furnished in normal times, at regular prices.—J. A. Piper, Editor.

Oil-Heat Silver Anniversary

THE Oil-Heat Institute of America announces their Silver Anniversary convention and products exposition of the oil burning and allied industries at The Coliseum, Chicago, April 5th through 8th, 1948. This is a national exposition celebrating 25 years of progress—1923-1948.

This is No. 1 in a series of messages to help you increase your understanding of business paper advertising, and its effect on your future security

Could you get a raise if your company stopped advertising?

Suppose your company were to divide up its advertising appropriation among all its employees—in the form of bonuses, let's say, according to the sales you made or the amount of work you turned out. Would you be better off?

Well, for a while you might be. For a few weeks, or even months, you and your company might coast along on a business-as-usual basis. Plenty of orders on the books. Lots more where they came from. Plus all that advertising money you'd be saving.

Or is "saving" the right word?

If your investment in advertising has paid off, how can you possibly *save* anything by stopping it? The real question is—how much do you stand to *lose*?

Curiously enough, you can't actually see what you're losing—at first. By the time you can, it's too late.

It's too late when some of your old customers begin drifting away. When new ones become harder to convince. When your competitors (who aren't "saving" a dime on *their* advertising) take over business that you have lost by default.

Once that happens, the cost of getting back into your stride may far exceed what was lopped off the advertising schedule in the first place.

There was one manufacturer, for example, who sought to "economize" by stopping all his advertising for two years. At the end of that period, his entire sales force, when asked for recommendations, put advertising at the

head of the list as the one thing they couldn't afford to be without. But it takes a lot of advertising effort to overcome the inertia of a stalled selling machine—and the manufacturer eventually had to spend a lot more than he thought he had "saved" to get the machine going again.

There are a *lot* of companies who had to learn this the hard way. The expensive way. But the time for expensive things is not now.

Advertising probably isn't your job. But you may have a voice in it some day, and certainly you have a big stake in it now. Because your company can't grow by *making* things—it can only grow by *selling* them. Advertising is simply selling on a mass-production basis.

Especially when it appears in the right business papers, advertising is the cheapest, the most efficient kind of salesmanship there is. That's because the readers of these papers are all alike in one respect; they comprise the greatest concentration of ambitious, dissatisfied, information-hungry people ever driven by a common interest. In both the editorial and the advertising pages, they look for, and find, the kind of ideas and information that will help them do their jobs better, and get ahead faster.

Call it enlightened self-interest. But isn't that why you yourself read this magazine?



AMERICAN ARTISAN

is a member of The Associated Business Papers

We have an interesting little folder which we think you'd like to see. It's called "What Does *No* Advertising Cost?" You can get your copy by writing to this publication. It's free — no obligation, except maybe to yourself.

Association Activities . . .

Indiana

THE third quarterly meeting of the Board of Directors of the Sheet Metal and Warm Air Heating Contractors Association of Indiana, Inc., was held in the Hotel Severin, Indianapolis, October 4th.

The following members responded to roll call: H. W. Meggs, president; O. N. Frank, vice president; Homer Selch, treasurer; Frank E. Anderson, secretary; Wm. Garber, sergeant-at-arms; Lex Balfour, John Novotny, A. Schnakenburg, C. O. Stauffer, and J. W. Walker, directors.

The 30th annual convention was one of many important matters which engaged the attention of the board until a late hour in the evening.

The 1948 convention will be held February 5 and 6 in the Hotel Severin, Indianapolis. Wm. (Bill) Garber Jr., is convention chairman with Homer Selch and Bud Carr as his able co-chairmen.

The new State Warm Air Heating Code has been passed by the State Administrative Council and is expected to be advertised and become effective later in the year. The many improved sections of this Code will prove of material benefit to contractor and consumer alike.

Dealers are reporting trouble in securing labor, so a committee is to contact the U. S. Employment Agency to ascertain if the tax payers money can be conserved by insisting that able bodied shirkers (now enjoying \$20 a week no-work-pay) be placed on a "no work—no pay basis."

The Tax Equality Committee has been assured by Chairman Harold Knutson of the House Ways and Means Committee that the hearings on Section 101 of the Internal Revenue Code would be complete and fair in every way.

Most any heating man will agree that the public's interest will be better served when the Public Utilities discontinue selling heating equipment.

Hotel reservations for the 30th annual convention should be made at once. Dealers address your favorite hotel. Sponsors and other wholesalers should rush their requirements to Wm. Garber, Jr., Chairman Hotel Committee, 3406 E. 10th St., Indianapolis.

President Meggs has appointed Wm. E. Garber, Jr. to service on the Advisory Council for the Policy Committee of the Indiana Construction Industry.

The association is compiling a 1948 Directory of Indiana Dealers. Every dealer should be listed, and every wholesaler should have a copy.

The annual picnic held in the old German Park on South Meridian Street, Indianapolis, on August 23rd proved a very enjoyable affair with music, dancing, games, contests, prizes and an abundance of free refreshments. Authentic report of the ball game is outlawed by Associated News from Reversia. Expert players and strenuous rooters were both prominent.—Frank E. Anderson, Secretary.

Jurisdiction—Engineering—Trade Relations

(Continued from Page 110)

illogical, to be corrected. Even so, we will find ourselves with labor costs at a high level.

One way to offset these high costs of labor is to make use of modern machines. Our industry has room for many small shops doing special work, and no doubt they have accumulated many handy tools over the years and have added new ones. But larger shops in order to reduce costs must arrange their shops to have benches devoted to layout and fabrication of different classes of work—round pipe, blow piping, square work, general jobbing, stainless steel, etc. with special machines required, located near each class of work.

Major machines are press brakes and power shears, and best of all lockformers. Lockformers are inexpensive enough to be available to the smallest operator. With the accessories available, any shop can now make machine-made cleats of all types, using up scraps from shear trimmings. To meet higher costs, contractors should also have power rolls, angle formers, welding and flanging machines, etc. Of course, a sheet metal shop should consider our jurisdiction—up to 10 gauge—when equipping a shop.

A great cost reducer is a planned procedure from the entrance of raw materials to the layout benches and machines, using every means to ship completed work out of the shop away from machines where it interferes with production.

On individual field jobs, which include more than \$5,000 for duct work, it pays to set up a shop including two benches, rail, edging machines, lockformer, small roll, angle and bar cutter and an eight-foot brake. The shop sends out straight pipe ready for assembly, plus dampers, frames and other intricate work. The field shop makes all fittings and variables as needed, saving waiting time required while main shop makes the work.

Aluminum Sheets

Mr. Narowetz has used aluminum sheets on two-thirds of his work, using half or three-quarters hard, 2% temper, 36 x 96 in. in size with gauge .025 for ducts up to 20 in. in width and .032 for ducts 23 to 46 in. wide, and .040 for larger ducts and casings—approximately 22, 20 and 18-gauge compared to galvanized iron. We use galvanized angles on 4 ft. centers on ducts 24 in. and wider. We use an over-all estimate on a basis of sheet metal, and add to it ten per cent for use of aluminum. Because we firmly believe that aluminum is here to stay, we are installing a new press brake and shear, geared up to 30 and 60 strokes instead of the usual 20, because aluminum is easier handled as well as sheared.

All of this tends towards economy in production.

For welding aluminum, we also learned that the Helium Weld-Argonne Process was ideal and also the best yet for stainless steel. When welding is used as in breechings, you are able to omit the usual corner angles, and the same is true in making tanks. With current in the field, portable welders are profitable machines. Spot welders take care of riveting and are used on either black or galvanized iron, saving punching of sheets, etc.

Schaefer BRUSHES

"BUY SCHAEFER....IT'S SAFER"

Performance tested, SCHAEFER Brushes offer longer wear, better service, greater value—with the correct brush for every industrial and domestic use.

**SCHAEFER Flue and Boiler Brushes
of SILVER BRITE Rust-proof Wire**

SCHAEFER'S special alloy "Silver Brite" rustproof spring steel wire has been developed for longer wear, more effective cleaning. It offers extra value, extra satisfaction in any brush.



SCHAEFER
Rectangular Flue Brushes

No. S-415—2" x 4" x 4 1/2"
No. S-416—3" x 5" x 4 1/2"



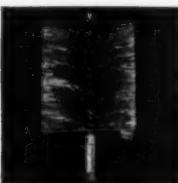
SCHAEFER
Boiler Brushes

No. S-393—1 1/2" x 4" x 5 1/2"
No. S-394—2 1/2" x 6" x 6 1/2"
No. S-395—3 1/2" x 6" x 6 1/2"



SCHAEFER
Boiler Brushes

No. S-390—1 1/2" x 4" x 6 1/2"
No. S-391—2 1/2" x 6" x 6 1/2"
No. S-392—3 1/2" x 6" x 6 1/2"



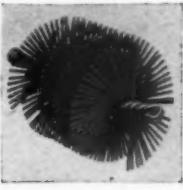
SCHAEFER
Boiler Brushes

No. S-399—2" x 4" x 6"
No. S-400—2 1/2" x 4 1/2" x 6"
No. S-401—3" x 5" x 6"



**Single and Double
Spiral Flue Brushes**

No. S-432—Single Spiral
—1" to 4" dia.
No. S-433—Double Spiral
—2" to 4" dia.
No. S-434—For small
Flues, 1/2" to
1" dia.



SCHAEFER Round Flue
Brushes of Single Spiral,
Flat Steel Wire

No. S-430—1" to 4" dia.



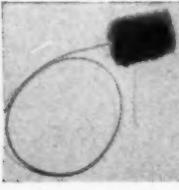
SCHAEFER Rectangular
Flue Brushes of Flat
Steel Wire—Spiral

No. S-420—2" x 3 1/2" x 4"
No. S-425—2 1/2" x 5 1/2" x 7"



SCHAEFER Furnaces
Brushes of Silver Brite
Rustproof Steel

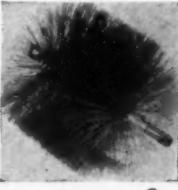
No. S-442—3", 4", 4 1/4",
5" x 5 ft. handle.



SCHAEFER Fibre
Furnace Brushes

Selected Bassine fibre,
flexible wire stem, 4", 5",
6" dia., 48" and 60"
handle.

No. S-444-445



SCHAEFER Chimney
Cleaning Brushes

No. 66—6", 7", 8", 10"
and 12" dia. round style
of Black Tempered Brush
Wire.

No. 66—6", 7", 8", 10"
and 12" dia. oblong style
of Flat Tempered Steel
Wire.



SCHAEFER
Wire Wheel Brushes
Solid Center Type of
crimped steel wire.
No. 276—6" dia. x 1 1/2"
face.
No. 278—6" dia. x 1 1/2"
face.
No. 280—10" dia. x 2"
face.

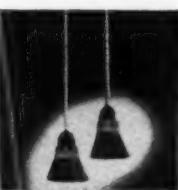


SCHAEFER
Handy Wire Brush
No. 816—For roughing,
soldering, etc., 6" long,
tempered steel wire
trimmed 1 1/2".



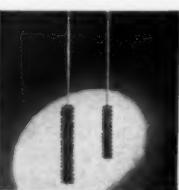
**Tin Handle Acid or
Dope Brushes**

Selected grade bristles in
tin ferrule. Width, 1/2",
1 1/2", 2", 2 1/2", 3".



T. W. Flat Acid Brushes
Tinners soldering brush,
horsehair filling, 1 1/2"
width, 7 1/2" overall.

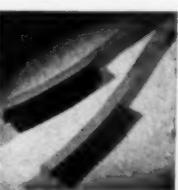
Twisted wire handle.



**Radiator or Condenser
Tube Brushes**

Twisted in wire handle,
selected hair or bristle.
Wide range of sizes.
No. 10—3/4" dia. x 2" brush
x 6 1/2" overall.

No. 11—1 1/2" dia. x 3" brush
x 8 1/2" overall.



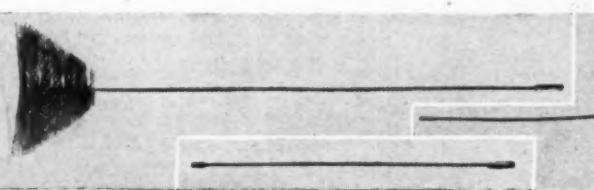
SCHAEFER Curved
Handle Wire Brushes
No. 810—Oil tempered
steel wire, trimmed 1 1/2",
hardwood block, 14" long.
Brush 6", 2, 3 or 4 rows.



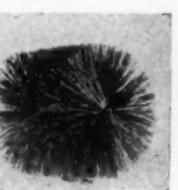
SCHAEFER Shoe Handle
Wire Brushes
No. 812—Oil tempered
rustproof wire, 5" brush,
2, 3, 4 rows. Trim 1 1/4",
overall 10".



SCHAEFER Straight
Back Wire Brushes
No. 800-11—Oil tempered
steel wire. Hardwood
block, 7 1/2" x 2 1/2". Wire
trim, 1 1/4", 6 x 10 rows.



SCHAEFER Vacuum Cleaner Brushes
No. 1005—Bassine Fibre Brush, 10 1/2" dia. tapered
to 3" dia. x 6 ft. long—48" handle with
threaded nipple at end.
No. 1000—Bassine Fibre Brush, 10 1/2" dia. brush x
10" long. Handle 39" with threaded nipple at end.



Wire Flue Brush and Extension Handles
4 ft. Handles with Nipple and Coupling.
5 ft. Handles with Nipple and Coupling.
6 ft. Handles with Nipple and Coupling.

Write for SCHAEFER Catalog of flue and furnace brushes, or for information on any special brushes for specific requirements.

SCHAEFER BRUSH MFG. CO.

1025 South Second Street Milwaukee 4, Wisconsin

EQUIPMENT DEVELOPMENTS

168—*Superdraft*

A Superdraft which overcomes weak or faulty chimney drafts which prevent effective combustion is offered. Electrically-operated and

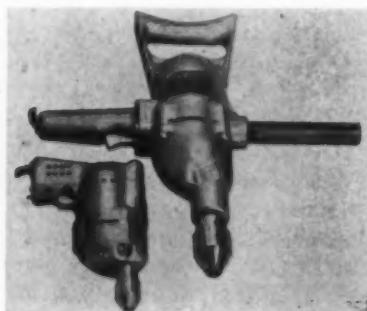


simple to install in the stove pipe, this accessory assures a clean-burning, full-bodied flame where a proper draft cannot otherwise be obtained.—*Perfection Stove Company, 7609 Platt Avenue, Cleveland 4, Ohio.*

169—*Home Utility Drills*

Home-Utility portable electric drills are available in two capacities—the $\frac{1}{4}$ in. and $\frac{1}{2}$ in.

Both are powered by universal motors which use either alternating or direct current. They have strong, light, die-cast aluminum housings . . . sturdy gears, pinions and bearings . . . instant-release trigger switch . . . fast-operating Jacobs chucks . . . three-wire electric cord for ground connection.



“Home-Utility” Bench Stands for each model convert the Drills into convenient drill presses for more delicate work; for leverage in tough drilling; for drilling to a pre-determined depth; for correct spacing of multiple holes in a strip or plate; while freeing one hand to guide work and lubricate drilling.—*The Black & Decker Mfg. Co., Towson 4, Md.*

Use the Coupon on Page 146

170—*Klem No. 74*

A new type chemical stripper that efficiently removes gilsonite, rubber base and metacrylate finishes is being offered.

Klem No. 74, removes stubborn paints and enamels. Paint film is not disintegrated and no residue is left on the surface. Costly hand scrubbing is eliminated and the surface is left clean for the next operation.—*Klem Chemicals, Inc., 14401 Lanson Avenue, Dearborn, Michigan.*

171—*Luty Furnace*

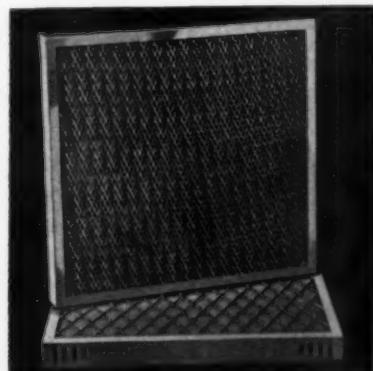
The Luty oil furnace with Btu output at bonnet of 100,000 per hr. has been announced. A heavy gauge electrically welded steel heat exchanger is mounted on the blower cabinet. Half the air travels horizontally through the air tunnel and half vertically around the outside of the heat exchanger to obtain maximum heat transfer. Casing is 20-gauge, finished in blue.

In the firing assembly, the air is introduced tangentially into the

172—*Aircor Filter*

Aircor, a permanent, cleanable, viscous type air filter, is announced.

The Aircor mesh design traps dust through depth while providing a minimum of air resistance. Galvanized, crimped, expanded metal



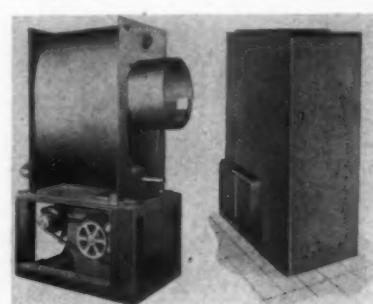
screen deflects air stream, acts as lint arrestor.

Heavy gauge galvanized steel frame has full welded corners and drain slots for cleaning. Rated filtering efficiency 98.5 percent. Standard 1 and 2 in. widths.—*Air Filter Corporation, 2514-A W. Lisbon Avenue, Milwaukee 5.*

173—*A-P Oilifter*

The A-P Oilifter automatically lifts oil from bulk storage tank to appliance 25 feet above the tank, or 100 feet away horizontally.

The Oilifter is connected to the heater oil control and to the bulk storage tank in the basement or



circular windbox, causing it to rotate. The air spirals through the annular space between the two sleeves of the firing assembly and meets the oil spray as it enters the combustion zone.

Both the oil and air enter the combustion chamber in the form of a hollow cone. The flame aspirates products of combustion along the edge of the fire cone, producing a re-circulation effect.

The power unit at the bottom of the burner vestibule, is rubber mounted and flexibly connected to the air duct. The fuel unit is belt driven to reduce the pump speed.—*Peerless Air Conditioning Company, Inc., 217 Wyoming Avenue, Detroit 20.*



outdoors. It requires only a single $\frac{1}{4}$ in. tubing—no return line is necessary. It is powered by a sturdy, silent-operating electric motor that can be plugged into the standard circuit.—*Automatic Products Company, 2450 North Thirty-Second St., Milwaukee 10.*



"Please!"
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MARCH
OF DIMES

JANUARY 15-30



THE NATIONAL FOUNDATION FOR INFANTILE PARALYSIS

FRANKLIN D. ROOSEVELT, FOUNDER

EQUIPMENT DEVELOPMENTS

Use the Coupon on Page 146

174—Doorway Canopies

Koolvent circular aluminum doorway canopies are in production; made of weather-resistant aluminum with aircraft type riveted construction. Finished with baked-



on enamels in a variety of color combinations, they may be repainted at will.

Koolvent circular doorway canopies are furnished in sizes and styles to fit all standard doorways.

—Koolvent Aluminum Awning Distributors, Inc., P.O. Box 1855, Pittsburgh 30, Pa.

175—Logan Lathe

For industrial school and home workshop use, a completely equipped sheet metal working shop mounted on a heavy gauge steel stand nearly 6 feet in length is now being produced. Each tool will process up to 20-gauge sheet steel. Heavier



gauges of aluminum, zinc, pewter, copper, plastics and other softer materials can be worked. The complete unit includes five tools—nibbler, 12 in. slip roll, hand punch, 12 in. brake and shear.

Each of the five tools is also available for individual purchase.—Berkroy Products, Inc., 336 Magnolia Street, Oakland 7, California.

176—Adhesive Tape

No. 263 Fiberglas industrial adhesive tape is a thin, light, strong fabric tape that gives a firm seal. The tape is a wedding of two materials: a Fiberglas cloth backing and

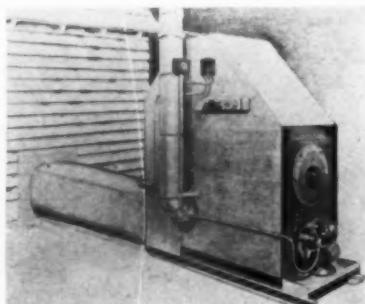


a vulcanizable adhesive mass to be used as an air seal in the fabrication of flexible duct connectors.—Bauer & Black Div., The Kendall Company, 2500 S. Dearborn St., Chicago 16.

177—Corn Dryer

A Powerated mobile corn dryer unit can deliver 70 deg. F temperature rise above outside temperature with air volumes of 6,500 cfm. Output exceeds 460,000 Btu/h, and is intended for small tonnage problems in drying hybrid and cereal corn, grains, hay, beans, or wood.

Features—Stainless steel refractory; Air stream inlet screened with $\frac{1}{2}$ in. mesh and flue outlet screened with $\frac{1}{8}$ in. mesh to prevent transmission of inflammable material to crib and barn; Adjustable controls to compensate for temperature var-



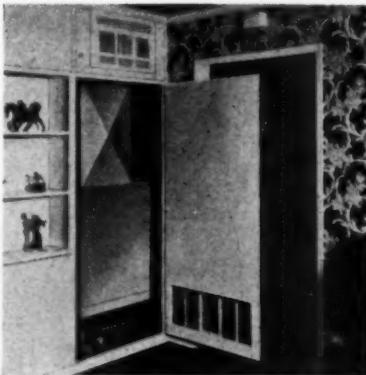
iations during operation, and outside temperature variants; Tubular design to assure maximum 90 percent direct radiation surface; Air distribution over surface controlled by proper up-draft and down-draft baffling to maintain minimum skin temperatures and maximum heat transfer resulting in maximum efficiency coupled with maximum longevity; Oil fired (consumption rate 4.5 gallons per hour); Safety controls in case of flame, ignition or fan failure.

Fan or blower unit may be operated without operating furnace.—Jackson & Church Company, Saginaw, Mich.

178—Royal Jet-Flow

The Royal Jet-Flow blows a layer of hot air across the ceiling at a temperature sufficiently high to assure steady radiation of heat to the floor at a velocity of 250 fpm, achieved through the use of a venturi principal.

The Royal Jet-Flow forces warm air at a velocity of approximately 250 feet per minute without using blowers or fans. Cold air is drawn in through a register at floor level, heated as it passes over the fire-box,



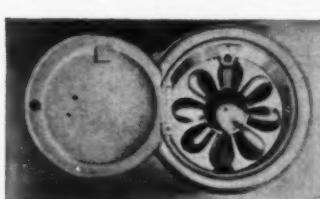
then compressed as it rises into a cone-shaped duct leading to outlet registers at almost ceiling height.

A three-way adjustable baffle allows heat to be distributed in any desired volume or direction.

The use of Bunsen-type burners and a corrugated fire-box avoids annoying noises. The fire-box is constructed of low alloy, high tensile steel. The Jet-Flow is manufactured in three sizes (25,000, 38,000 and 55,000 Btu), designed to burn natural, manufactured or L. P. gas. AGA approved.—Royal Heaters, Inc., 1024 Westminster Ave., Alhambra, Calif.

179—Ventilating Fans

A complete line of ventilating fans—in eight, ten and twelve-inch sizes—are arranged for wall, ceiling, window, or glass block installation. They are finished in baked white



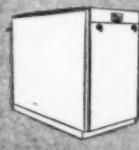
enamel, use an induction type motor, wiring is concealed, adjustment is arranged for wall thicknesses, current: 110 volts, 50 or 60 cycle, A.C. Opening the fan door turns on the fan.—Scott-Newcomb, Inc., 1442 S. Boyle Ave., St. Louis, Mo.



Here's Why THATCHER Moves Ahead in PITTSBURGH

Louis Martin has been one of Pittsburgh's progressive warm air men for 15 years. He buys Thatcher units from Proie & Coogan Heating Company. Martin tells us the rugged construction of Thatcher units makes them a cinch to sell. What's more, the fuel customers save with Thatcher makes these customers his best salesmen.

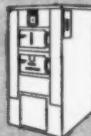
Pile Up PROFITS This Easy Way
Your customers want the quality construction, the trouble-free service, the fuel economy that's characterized Thatcher furnaces for 97 years. That's why Thatcher can mean more sales, bigger sales for you. So recommend yourself by recommending Thatcher — your warm friend since 1850.



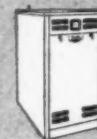
Comfortmaster
Oil-fired
Air Conditioner



Comfortmaster
Gas-fired
Air Conditioner



Triple-Fire
All-Purpose
Boiler



Oilmaster
Automatic
Oil-fired Boiler



Thermostar
Gravity
Furnace



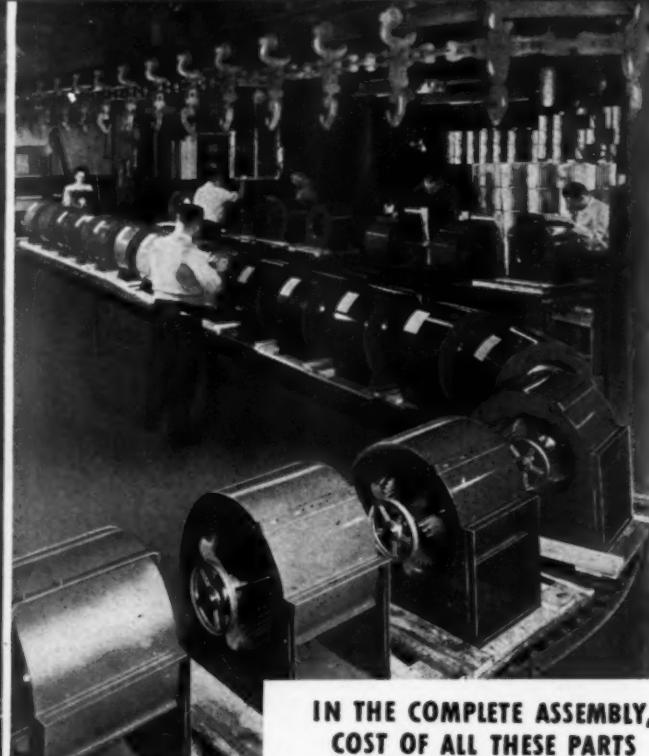
Thatcher

SPECIALISTS IN HEATING SINCE 1850

FURNACE COMPANY
Garwood, New Jersey

Lau Blower

mass production methods
CANNOT BE MET by small-quantity assemblers



IN THE COMPLETE ASSEMBLY,
COST OF ALL THESE PARTS
MUST BE CONSIDERED

- Wheel
- Motor Mounting
- Shaft
- Cutoff
- Bearings
- Housing Sides
- Collars
- Housing Back
- Washers
- Nuts
- Bolts
- Blower Pulley
- Bearing Support
- Motor Pulley
- Blower Support
- Belt

And, besides, there are labor, purchasing, warehousing, painting and stocking costs, material spoilage and waste, attendant merchandise losses, inventory costs, plant handling, and the cost of final assembly. If blower is not installed in the furnace before shipment there are additional, expensive packaging costs.

There are many positive advantages—the ultimate one being *exact, known costs*—in buying blowers completely assembled, packaged, ready to put on the line. It may seem a simple matter to buy wheels and then build housings for them. But it isn't so simple—your problems are innumerable, and your costs questionable. Besides, the combination may not be exactly right for efficient air delivery performance.

Lau has an investment of thousands of dollars in engineering and equipment to say nothing of years of testing and research in order to produce standardized blowers with precision-matched wheels and housings for best possible performance. Performance is a known quantity. Costs are known. Mass production facilities of this largest manufacturer of furnace blowers make it possible for Lau to offer you unmatched low prices for complete blower assemblies. If you've been thinking about building your own blowers, get all the facts first. Write.

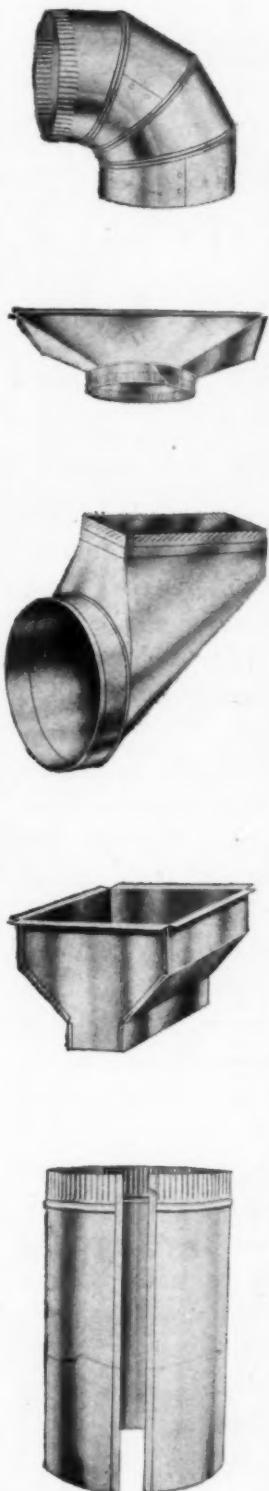


BLOWER COMPANY
DAYTON 7, OHIO, U. S. A.

WORLD'S LARGEST MANUFACTURER OF FURNACE BLOWERS



Showing just a few
Char-Gale fittings



CHAR-GALE ALUMINUM Fittings

THE ANSWER TO SUCCESSFUL
AND PROFITABLE FURNACE
INSTALLATION

Feather Light



The easiest handling fittings ever made! Cut strain and time on installations—cut transportation time and cost—cut handling time on the job.



Stronger - Longer Lasting



Rustproof clear through! Installations are stronger with aluminum—last years longer.



Better Looking

More customer satisfaction! The smooth, bright beauty of these fittings does not discolor with heat or time. Needs no painting or covering—just naturally beautiful.

And It Costs No More!

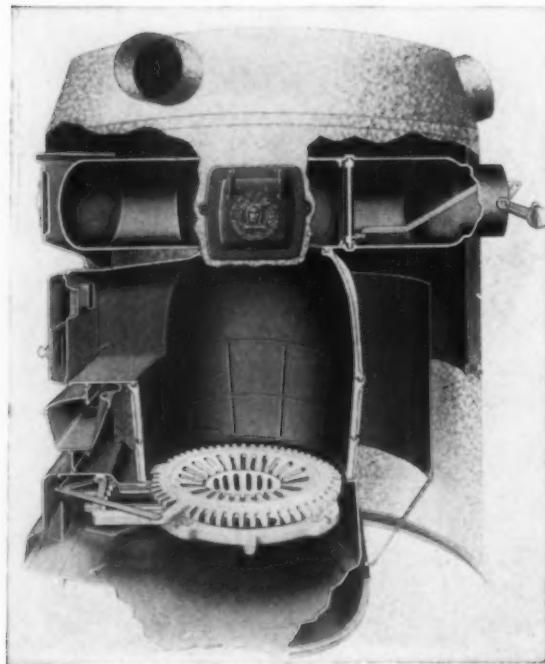


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OMAHA

ANOTHER PRODUCT OF CHAR-GALE METAL CRAFTSMEN

"NO HEATING PLANT IS BETTER THAN ITS INSTALLATION — NO INSTALLATION CAN BE BETTER THAN ONE OF CHAR-GALE FITTINGS"

ROUND OAK Dealers



The famous Moistair Blended-Iron "J" series furnaces (illustrated above), incorporating all the features that have made Round Oak a great name in warm air home heating since 1871, will soon be in production.

REPAIR PARTS

Round Oak promises you that adequate stocks of replacement parts for the line of furnaces, stoves, and ranges, now in service are available to meet the repair needs of your old customers.

Here's Good News for You



It is with genuine pleasure that we make the following announcement to all you heating and equipment dealers, who have long recognized Round Oak furnaces as one of the most profitable lines on the market.

Plans have now been completed for the operation of Round Oak Company, Inc., a newly formed corporation which has purchased the inventory, patterns, and trade name of the famous Round Oak line of furnaces, coal stoves and ranges.

The new officers are a group of aggressive veteran heating equipment manufacturers. In assuming control of the new Round Oak Company, they feel it is a challenge to have the opportunity to carry on the old established traditions of "Round Oak" which have been famous since 1871.

The new officers and management pledge to all dealers and customers that Round Oak's long established standards of quality and reputation for customer satisfaction will be fully maintained. Your franchise as a Round Oak Dealer will now be of more value than ever before. If you are not already handling the Round Oak Line, it will pay you to investigate our liberal dealer terms. Write today.

ROUND OAK COMPANY, INC.

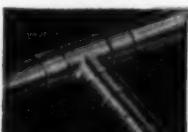
Dowagiac, Michigan



"WE'RE FIXING IT FOR KEEPS THIS TIME, SONNY"



Screens rusty? Plan now to replace them with durable bronze. It's the time-tested standard of quality for screens.



Put an end to rust-clogged or leaking water pipes with Anaconda Copper Tubes. Easily and quickly installed by your plumbing contractor.

THIS REPAIR JOB would not be necessary had copper been used in the first place. For sheet metal work of copper is an outstanding investment in durability and money-saving, rust-free service.

If a look at your own valleys, roof flashings, gutters and downspouts reveals serious rusting, plan now, before walls and ceilings are damaged, to replace them with time-tried copper.

We suggest that you discuss needed repairs with your sheet metal contractor now. The more time you give him, the more likely he will be able to obtain Anaconda Sheet Copper—your assurance of utmost quality.

Have you a copy of the free booklet, "How to Protect Your Home Against Rust?" If not, write today.

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home magazines is designed
to help you get, not just more
business... but the best of the
business.

Note too, that Anaconda is
asking your customers and
prospects to do their planning
early... to give you more time
to obtain the quality material
you both prefer.

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 Subsidiary of Anaconda Copper Mining Company
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with

2 EASY WAYS to make some EXTRA CHRISTMAS MONEY!



1 USE THE TELEPHONE

Added sales! Increased profits! Get them now by boosting your *service* business. Use the *filter replacement* story to interest prospects. And you can do it by phone! "BRINGING IN NEW BUSINESS BY PHONE" tells you how to do it easily, effectively. Write today for booklet No. D47-35. It's free.

2 USE THE MAILS

Another easy way to profitable, extra service business. Use the *filter replacement* story as your lead-in. Do it by mail. These timely mailing cards (Form No. D47-20) are free. Ask your distributor for a supply today, or write Owens-Corning Fiberglas Corporation, Dept. 930, Toledo 1, Ohio.

In Canada, Fiberglas Canada, Ltd., Toronto, Ontario

*Build Extra Business
and Profits with*



OWENS-CORNING FIBERGLAS CORPORATION

"Your partner whose Actions speak louder than words"

THERE'S A
REASON
FOR
J & C SALES APPEAL AND
PERFORMANCE
POPULARITY



J & C gives you a "mainliner" for increased profits and complete coverage in the warm air heating field.

Concentrate on selling the more than 100 J & C models and have the proper unit for every heating job from 52,500 to 3,800,000 Btu output.

The J & C line does not require special installation and is adaptable to Panelaire or any approved warm air system.

You can bid with confidence for jobs specifying greater heating requirements if you handle the "PoweRated" line. It will bring you plenty of industrial and commercial processing business, too, for J & C PoweRated is a nationally known trademark of distinction in drying and processing.

Concentrate on J & C . . . assure profits with the line of proven popularity.



HERE'S
THE INSIDE STORY

- ① Air distribution over surface controlled by proper up-draft and down-draft baffling to maintain minimum skin temperatures and maximum heat transfer. Result is maximum efficiency coupled with maximum longevity.
- ② The large filter area removes dirt particles from the air . . . protects the nose, throat and lungs, and keeps interior decorations fresh and clean.
- ③ Ample flue passage vents burned gases.
- ④ High quality refractories protect the heavy gauge combustion chamber in the oil-fired unit. In the gas-fired unit there is no impingement of the flame against the combustion chamber.
- ⑤ Famous J & C tubular design (heavy steel tubes welded into the heat exchanger) reduce stack temperature, and increase the radiation surface.
- ⑥ Die formed of heavy gauge steel, heating element is welded in one piece with the "Outside Corner" type of weld to make it leak-proof and gas-tight.
- ⑦ Safety controls guard against power, flame, ignition, or fan failure.
- ⑧ Welded steel inner-liner keeps heat where it belongs.
- ⑨ Quiet centrifugal-type blower is balanced and suspended in self-aligning, cushioned bearings.
- ⑩ Sturdily constructed cabinet has definite eye appeal.

A PRODUCT OF **J&C**

JACKSON & CHURCH COMPANY, SAGINAW, MICH.



Your best *Profit* move

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IMPROVE YOUR KNOWLEDGE OF AIR CONDITIONING

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288 Pages—6 $\frac{1}{4}$ " x 9 $\frac{1}{4}$ "—Illustrated—

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Here is a book that presents—in simple, readily understandable form—every kind of information necessary for an accurate and thorough knowledge of air conditioning principles, equipment and practices. Written by S. R. Lewis, a widely-known consulting engineer who has been active in air conditioning work for more than thirty years, it deals with all angles of the air conditioning subject from the practicing engineer's viewpoint. The designing procedures explained in the book are, for example, in every detail the same procedures employed today by the author's own organization.

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- CHAP. 4—Air Conditioning and the Human Body
- CHAP. 5—The Psychrometric Table and Chart
- CHAP. 6—Humidity Controllers and Control
- CHAP. 7—Heat Transmission Through Barriers
- CHAP. 8—Ventilation, Solar and Appliance Heat
- CHAP. 9—Heating Systems
- CHAP. 10—Air Conditioning Systems
- CHAP. 11—Air Conditioning Apparatus
- CHAP. 12—Refrigeration and Refrigerants
- CHAP. 13—Refrigeration Compressors and Condensers
- CHAP. 14—Refrigeration Evaporators and Auxiliaries
- CHAP. 15—Record Forms for Heating and Cooling
- CHAP. 16—Air Distribution
- CHAP. 17—Water in Air Conditioning
- CHAP. 18—Noise and Its Control
- CHAP. 19—Air Conditioning Instruments and Measurements
- CHAP. 20—Codes and Operating Suggestions
- 10" x 16" Psychrometric Chart.....

Inside Back Cover

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**Complete Specifications and Performance Data
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Featuring

THE
New
**STREAMLINED
BEARING BRACKET**

With Sight Feed Oil Gauge

Only REX Blowers possess the outstanding feature pictured at the left. This new bearing bracket permits the bearings to be easily removed, and holds 2 to 4 times as much oil as the average bearing of conventional design. It contains a visible oil reservoir and facilitates self-alignment of the bearings. There is no rubber around the bearing proper to act as a heat insulator which would tend to cause overheating. Tests have proven that a REX Blower equipped with this new Bearing Bracket requires oiling only once every two years.



CONTENTS

This sixteen-page catalog explains and illustrates the eleven outstanding features of REX Blowers and Blower-Filter Units. It furnishes all the information necessary to facilitate immediate placement of your order. The information covered includes: Blower Selection; Outlet Velocities; Correction for Inlet Restrictions; Bearing Features; Housing Dimensions; "Sqair" (Universal) Units; AIR-PAK Blower-Filter Units; Multiple Blower Assemblies, and Performance Data at Various Static Pressures.

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is FIRST with a new,
dynamic SELLING PLAN to push
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ALL TIME HIGH!



3 and 3-The Magic Key TO COLD WEATHER SALES

Wham! Right smack-dab in the middle of cold weather Oil-O-Matic is making history with a big league advertising-promotion program for its dealers.

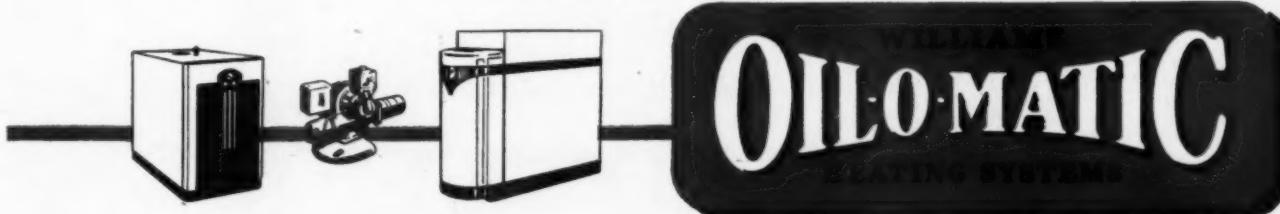
Amazed? There's no amazement at Williams Oil-O-Matic. Dealers eat, pay taxes, rent, overhead and salaries in winter, too—don't you?

Well, we feel duty-bound to keep our dealers on a money-earning basis the year 'round. Maybe others say this, too. BUT at Oil-O-Matic it's not lip service. We mean it. We're doing something about it.

You'll find no Oil-O-Matic dealers planning to hibernate this winter. They're busy as beavers right now launching the biggest winter selling campaign in oil burner history. "3 and 3" is its magic title . . . and it's packed with selling power.

When you become a Williams Oil-O-Matic dealer you get to expect selling support like this. Ask one!

WILLIAMS OIL-O-MATIC DIVISION, EUREKA WILLIAMS CORPORATION
Bloomington, Illinois



THE OIL BURNER CONTROL

MERCOID VISAFLAME

(LIGHT ACTUATED) CONTROL SYSTEM

FOR DOMESTIC AND INDUSTRIAL OIL BURNERS



Do You Have Them?

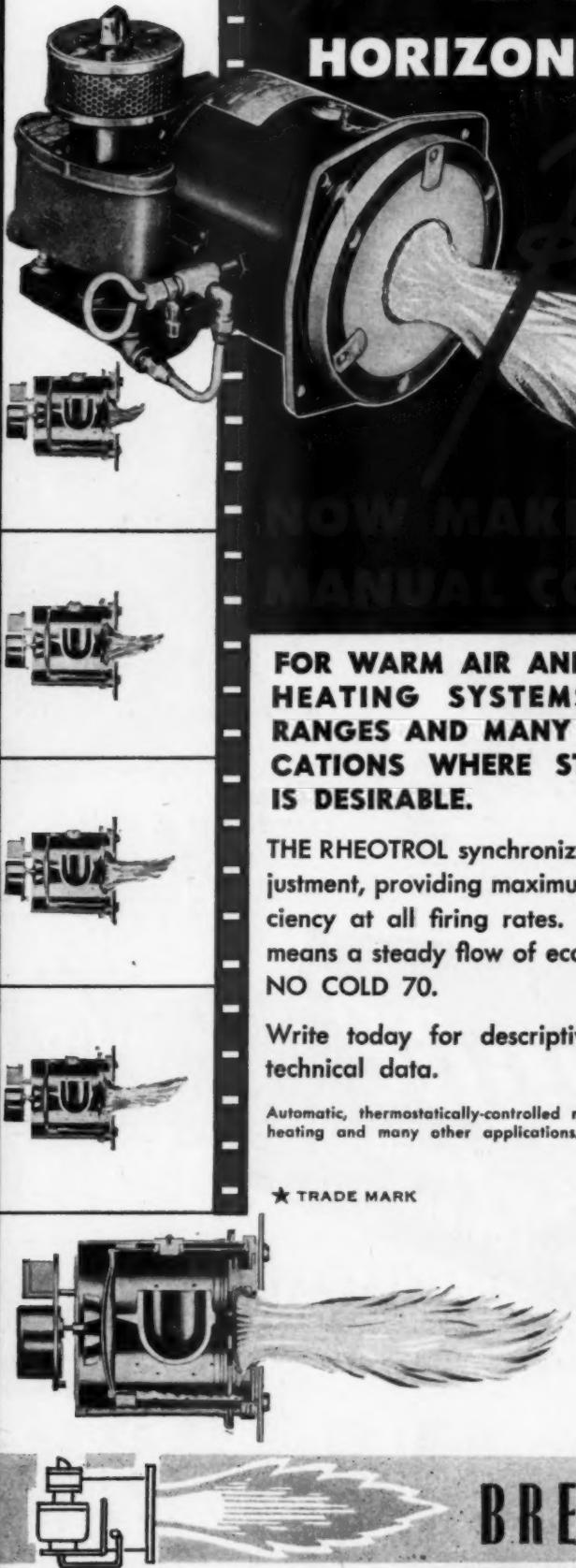
Every oil burner manufacturer, dealer and service man who does not have a copy of Bulletin V-14 which gives a full description of the Merco Visaflame Control: also the installation instruction card, should write for copies now.

The Merco Corporation, 4201 Belmont Ave., Chicago 41, Ill.

THAT EVERYBODY

LIKES AND EVERYBODY WANTS

ANY FIRING RATE FROM PILOT TO HIGH FIRE, AS SMOOTHLY AS A MOTION PICTURE



BREESE HORIZONTAL BURNER WITH

Rheotrol
NOW MAKES
MANUAL CONTROL PRACTICAL

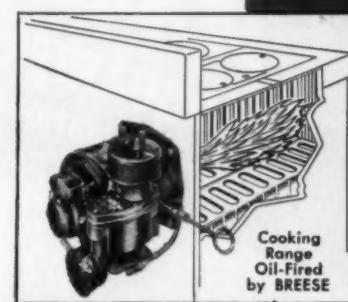
FOR WARM AIR AND HOT WATER
HEATING SYSTEMS, COOKING
RANGES AND MANY OTHER APPLI-
CATIONS WHERE STEADY FIRING
IS DESIRABLE.

THE RHEOTROL synchronizes air and oil ad-
justment, providing maximum combustion effi-
ciency at all firing rates. Modulated flame
means a steady flow of economical heat . . .
NO COLD 70.

Write today for descriptive literature and
technical data.

Automatic, thermostatically-controlled models also available for
heating and many other applications.

★ TRADE MARK



BREESE BURNERS inc.

FORMERLY OIL DEVICES
CHICAGO 11, ILL.

RESEARCH AND ENGINEERING
SANTA FE, NEW MEXICO

341 EAST OHIO STREET

FUEL COSTS GO DOWN—

**When You Install
UNITHERMS!**



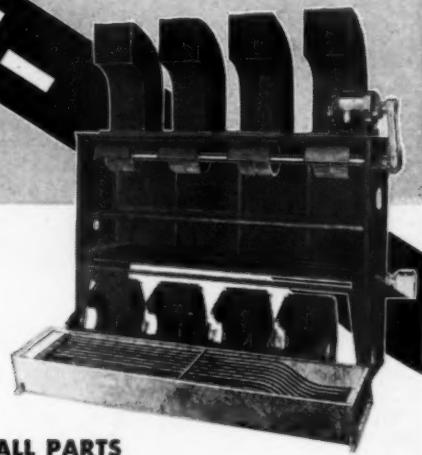
**... for Smaller Jobs
and to Help Out**

Clarco horizontal and vertical units are used for heating small factory areas, buildings where heat losses are concentrated around outside walls, for offices, etc. They take no floor space—suspend them from walls or ceiling.



**Suspended Type
Saves Floor Space**

These Unitherm Unit Heaters can be easily attached to roof members, or suspended at other convenient locations. All Unitherms deliver heat at high velocity over wide areas—equipped with centrifugal fans; heating coils for pressures up to 200 lbs.; V-belt drive or direct connected.



**ALL PARTS
EASY TO GET AT**

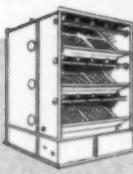
View above shows Floor Type Unitherm Unit Heater with fan housings and heating coil removed. All parts are accessible by loosening a few bolts and taking off front or back side of heater casing.

Clarage
—HEADQUARTERS FOR AIR HANDLING
AND CONDITIONING EQUIPMENT

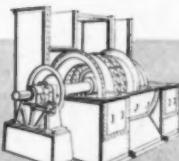


**CLARAGE FAN COMPANY
KALAMAZOO, MICHIGAN**

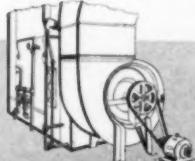
APPLICATION ENGINEERING OFFICES IN ALL PRINCIPAL CITIES



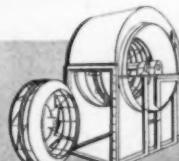
AIR WASHERS
AND PURIFIERS



MECHANICAL DRAFT



INDUSTRIAL AIR
CONDITIONING



AIR FOR INDUSTRIAL
PROCESSES

Contact us Now about this Remarkable
New

ROBERTS
Automatic Oil
FLOOR FURNACE

APPROVED
BY
UNDERWRITERS'
LABORATORIES
INC.

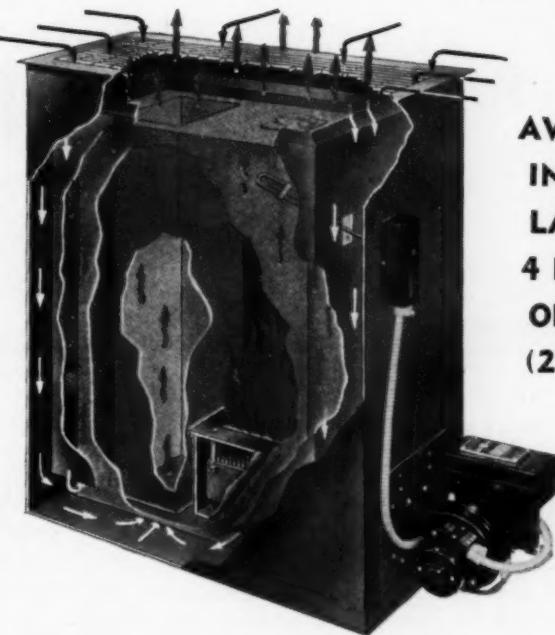
14" WIDTH
ELIMINATES
CUTTING
OF FLOOR
JOISTS
AND
WEAKENING
FLOORS

HEATS UP
TO FIVE
ROOMS

INSTALLED
BY TWO
MEN
IN FOUR
HOURS

BURNS
NO. 3
OIL
OR
BETTER

AVERAGE
INSTAL-
LATION
4 HOURS
OR LESS
(2 MEN)



SPECIALLY DESIGNED BURNER, COVERED BY PATENT APPLICATION,
THAT HAS A NON-IMPINGING FLAME, REDUCING CARBON TO A
MINIMUM AND ELIMINATING THE NECESSITY OF CARBON CLEANING

Shipped as a complete unit . . . Automatic thermostatic control standard equipment. Model AK-101, 52,000 BTU. Width 14", Length 30", Depth 35". Flue Pipe 6" diameter. Draft required, .05" water column. Heavy steel electric-welded heat exchanger. Grill, oak finish. Rust and corrosion-resistant casing and air separator. Shipping weight 165 lbs. Draft booster blower.

APPROVED BY UNDERWRITERS' LABORATORIES, INC., FOR
AUTOMATIC TEMPERATURE CONTROL

A Limited Number of Dealer Franchises Available

ROBERTS FURNACE
DIVISION OF BONE TOOL & GAUGE COMPANY

Boost sales now with this new low-priced Kaiser Aluminum!

You can get ahead in production — and profits — with Kaiser Aluminum Utility Sheet.

A controlled alloy, Kaiser Aluminum Utility Sheet is high grade aluminum through and through. It can't rust or streak, need never be painted, and strongly resists corrosion.

Handle it as you would any sheet metal! Fabricate a Pittsburgh Lock Seam easier than you ever thought possible. Form it as you like, quickly and simply. Finish it in almost any way!

Because it's aluminum, it's light enough to let

you build and install entire sections of duct with only two or three men. But it's strong enough to last generations.

And its long-lasting, bright beauty can add an extra sparkle of *sell* to your products!

Can any other material offer you all these advantages?

For immediate information on specifications and prices — and for prompt deliveries in less than carload lots — call the Permanente Products sales office nearest you *today*.

Kaiser Aluminum Utility Sheet

a Permanente Metals product

SOLD BY PERMANENTE PRODUCTS COMPANY, KAISER BLDG., OAKLAND 12, CALIFORNIA . . . WITH OFFICES IN:
Seattle • Oakland • Los Angeles • Dallas • Wichita • Kansas City • St. Louis • Atlanta • Minneapolis • Milwaukee • Chicago
Cincinnati • Cleveland • Detroit • Boston • Hartford • Buffalo • New York City • Philadelphia • Washington, D. C.



Presenting... with pride, another great addition to the most complete line of gas-heating equipment in the nation



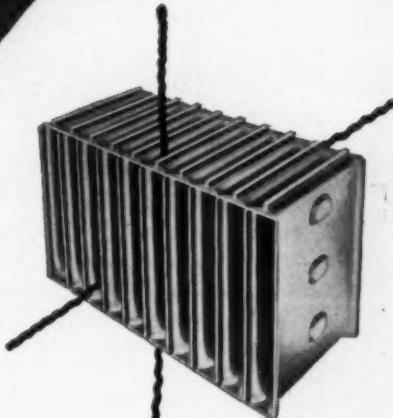
Bryant Modernaire, Model VS-304 Winter Air Conditioner. Fully automatic, made in six sizes (45,000 to 145,000 btu) for all types of domestic application. Unit completely factory-assembled. Controls readily accessible for service or adjustment. Features the exclusive Bryant H-pilot for positive burner operation and control; efficient high static blower for smooth, steady circulation of air; scientifically designed, cast iron burner with raised, drilled ports. Completely enclosed by attractive Bryant-grey jacket of heavy-gauge steel.

You have waited for this great new gas-fired winter air conditioner. In its design and operation are the features you require for heating equipment in housing designed for forced warm air. In a single or multiple installation, the Modernaire provides the kind of fully-automatic, trouble-free operation that pays off all down the line . . . from sales appeal to economy to customer or tenant satisfaction.

Amazingly compact, this Bryant-engineered beauty is a long-lived space saver that can be installed almost anywhere. The smallest of its six sizes, adequate for apartments or small homes, can actually be installed in a small closet. Efficiently and surely, the Modernaire does the four big winter air

conditioning jobs . . . providing warm, filtered, smoothly-circulated air with the right amount of humidity.

Take your cue from the owners of the soon-to-be-constructed Tremont Apartments at Allentown, Pa., who have already specified the Modernaire for individual heating in its 126 modern suites. *Sell—install—specify the Bryant Modernaire!* For details, contact your Bryant representative or write direct to Bryant Heater Co., 17825 St. Clair Ave., Cleveland 10, Ohio . . . *One of the Dresser Industries.*



...with the HEVIGAGE STEEL HEAT EXCHANGER!

Made by the industry's most advanced machine welding process, this rugged heat exchanger is fabricated from 12-gauge steel, approximately *three times* as thick as minimum A.G.A. requirements. Designed for straight-line flow, both horizontal and vertical, there is no complicated travel of warm air or hot gases. There is no dead metal . . . *every inch* of the HEVIGAGE works at its job. It will outlast ordinary heat exchangers by many years.

the NEW products
come from bryant



bryant
GAS
HEATING
LET THE PUP BE FURNACE MAN

NEW LITERATURE

Use the Coupon on Page 146

246—Auer Register Book 48

Register Book No. 48 lists and illustrates all items in the entire Auer line of registers and return faces for gravity or air conditioning systems, including latest adjustable and air directional types.—*The Auer Register Co., 3608 Payne Ave., Cleveland 14.*

247—Airo-Fin Outlets, Register, Grilles

A two-page catalog sheet covers Airo-Fin registers and grilles with controlled deflection, fins $\frac{1}{4}$ -in. deep, $\frac{1}{4}$ -in. on centers, and ceiling outlets for draftless distribution of air by mixing conditioned air with room air. Stock sizes and list prices are included.—*Peerless Air Conditioning Company, Inc., 21700 Wyoming Ave., Detroit 20.*

248—Stic-Klip Products and Applications

"Stic-Klip Products and Applications" covers the attaching of many kinds of insulation to a variety of surfaces—for cementing to metals, masonry and wood. Stic-Klips are patented and eliminate the use of wiring and cementing insulation to ducts, building walls and ceilings.

The Stic-Klips are cemented to the ducts and ultimately become an integral part of the ducts. Two types of adhesives are available.—*Stic-Klip Manufacturing Company, 50 Regent St., Cambridge 40.*

249—Furnace Pipe and Fittings

Catalog No. 475 (16 pages) covers galvanized wall stack, baseboard stack, furnace pipe, return air pipe (round and rectangular), and fittings; side rail and connecting lock strips; as well as coal, oil and gas furnaces, stokers, accessories, controls and tools, with list prices.—*Made-Rite Company, Inc., 10th & Monroe Sts., Newport, Ky.*

250—Oil Burner Equipment

HomEase oil burner equipment is described in literature available. "For Cozy Home Comfort" is a four-page folder picturing the HomEase burner, with specifications of their Models HE-1 and HE-2. The story of "Flame Shape Control" is covered in a spirally bound booklet.—*HomEase Products Division, Inc., Bogue Electric Mfg. Company, 52 Iowa Avenue, Paterson 3, N. J.*

251—Engineering Data Book

An engineering data book provides all the fundamentals of pipe and fin coil calculation. The book has been compiled by engineers especially for draftsmen and designers to provide complete and easily accessible information necessary for laying out pipe and fin coils for heating and cooling application.

The book treats transfer "K" factors for all ranges of heating and cooling from minus 60 to plus 350 degrees F; gives recommended air velocities and fin spacing for fin coils; shows in detail how to calculate and design pipe and fin coils for all generally encountered heating and cooling loads. Price \$1.50.—*Rempe Co., 340 N. Sacramento Blvd., Chicago 12.*

The General

Make profits on every installation.
Eliminate troublesome call backs.
Build regular repeat business through cartridge replacements.
Help customers save money by giving cleaner burning fuel.
Build goodwill and customer loyalty by providing trouble-free operation.



CAN INCREASE YOUR
SERVICE DOLLAR VOLUME
WITH INSTALLATIONS



General HAS THE RIGHT FILTER FOR EVERY OIL HEATING PLANT!

The General is popular with all contractors, dealers and fuel oil service companies because it has proven the best fuel oil filter for heating plants, hot water heaters, and room heaters. The General will prove a profitable leader for you, tool Report after report in our files bear out these statements.

For average installations three models, DeLuxe 2A-300, Master 2A-700 and Economy 1A-25, are outstanding leaders in the General line because they are priced to sell easily, built to give long-lasting service, and designed to provide high-degree performance.

There is no better time than now in letting General Fuel Oil Filters increase your service dollar volume. Contact your jobber immediately or write direct for information and discounts.

Listed: Re-examination Service, Underwriters Laboratories.

GENERAL FILTERS
INCORPORATED

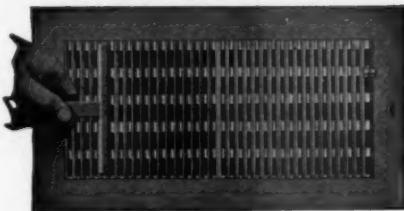
GENERAL FILTER

CANADIAN FACTORY BRANCH: GENERAL FILTERS CANADA, 173 STRACHAN AVE. • TORONTO 10, ONTARIO

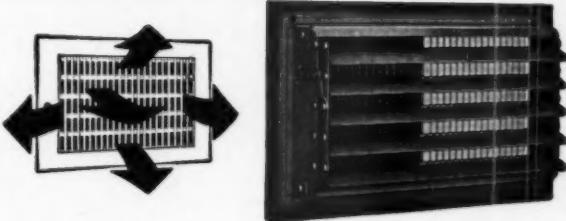
12890 WESTWOOD AVE.
DETROIT 23, MICHIGAN

Independent

WROUGHT STEEL REGISTERS PROVIDE 4 WAY ADJUSTABLE AIR FLOW



Design No. 238



Right . . . left . . . up . . . down . . . air flow at any angle desired, in addition to straight outward . . . plus the durable construction which has distinguished Independent products for more than 46 years . . .

These are the reasons for the popularity of this No. 238 Independent Wall Register. Vertical grille bars are manufactured at an angle of 30 degrees, one-half to the right and one-half to the left. They may be bent to direct air flow at any other right or left angle or straight outward. Horizontal multiple valves located at the back of register can be set to deflect air flow up, down, or straight outward. Available in standard sizes 8"x6" to 30"x8".



Send for Catalog 41-AC

Always Leading—Always Progressing

THE INDEPENDENT
REGISTER CO.

3747 E. 93rd STREET • CLEVELAND, OHIO

AN ANNOUNCEMENT OF EXTRAORDINARY IMPORTANCE to DISTRIBUTORS and DEALERS

RAYTHEON INVITES YOU

To Take Immediate Advantage Of One Of The Biggest Volume And Profit Opportunities That Has Hit The Electrical Appliance Market In Years

The Raytheon Home Precipitator is easy to install with any type warm air or ventilating system in any home or office.



the RAYTHEON HOME PRECIPITATOR

Cleans Air Electronically

Nine million prospects are now ready to be sold this remarkable new unit for removing every particle of airborne dust, soot, pollen and even

smoke from the air right where people live and breathe. It's a "natural" for modern living, instantly in demand wherever presented.

DON'T MISS THIS SELLING OPPORTUNITY

Wide-awake electrical distributors and dealers are signing up now while rich territories are still open. Your present customers plus hundreds of new ones in your area are red-hot prospects for this modern

appliance that points the way to better, healthier, cleaner living for all the family — theirs for but a few pennies a day. You've never had anything to sell with more selling impact.

RAYTHEON Backs You 100% With Sales Promotion, Display And Advertising Helps

For full details on this volume and profit opportunity-of-a-lifetime write, wire or phone today to RAYTHEON, Waltham, or to our nearest district office.

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Raytheon Manufacturing Co.
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Jackson 5325

BOSTON John True
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Wal. 5860

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Room 829, 222 W. Adams St.
Ran. 7457

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Main 3730

DETROIT
Raytheon Manufacturing Co.
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NEW YORK T. R. Porter
Raytheon Manufacturing Co.
60 East 42nd St.
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WASHINGTON, D. C.
Raytheon Manufacturing Co.
739 Munsey Bldg.



How We Use Arc Welding for Versatile Production

By H. E. Hansen, Superintendent
The Thornton Co., Cleveland, Ohio

IN our business we use electric arc welding as the fabricating tool for 99% of our work. We have found that welding affords the greatest designing flexibility, strength and production economy. A sheet metal shop with good welding equipment and competent welders can keep them busy all the time.

Recently we fabricated the dryer for chemicals shown in Fig. 1. This cylinder, 36" in diameter and 20' 8" long, was made in four sections. Three sections, each 5' long, are $\frac{3}{16}$ " mild steel, rolled and welded with one pass of $\frac{3}{16}$ " "Fleetweld 5" electrode. The fourth section, farthest from the camera, is 5' 8" long and is 10-gauge Type 304 stainless steel, rolled and welded with $\frac{5}{32}$ " "Stainweld A5-Cb" electrode.

In the picture can be seen the longitudinal diaphragms, which are $\frac{1}{4}$ " mild steel strips with formed lips. They were made in 5' lengths and welded to the inside wall of each mild steel section so as to match up when the sections were assembled. These welds, one-pass fillets, are made with $\frac{3}{16}$ " "Fleetweld 7." The stainless section has spiral blades, also Type 304, welded to the wall with "Stainweld A5-Cb."

Fig. 2 shows the welding of an electrical control cabinet. For this 16 gauge mild steel, $\frac{5}{32}$ " "Stable-Arc" electrode is used; tack welds give sufficient strength. The parts are clamped in a positioner which is rotated to put all welding in downhand position. Two sides and



Fig. 2. Bare "Stable-Arc" rod makes neat welds on this 16 gauge mild steel cabinet.

the back are formed from a single sheet, and sides are separate pieces with louvres spot-welded on. Hinges are spot-welded to the lid and arc welded to the cabinet. These methods make this a speedy production job.

Fig. 3 shows a cover for an electro magnet, made of mild steel. The top plate is $\frac{1}{4}$ " thick and sides are 10 gauge.

Due to thickness of the top plate, both its center hole and outside circumference are cut on a nibbler. Flame cutting is used to make the rectangular cut-out on the center hole. Welding electrode used is $\frac{5}{32}$ " "Fleetweld 7." The rolled side is first tacked to the top with 5" tack welds, then welded in one pass, with most of the arc playing on the heavier plate.



Fig. 1. This chemical dryer was made in 4 sections—
3 mild steel, one stainless.



Fig. 3. Convex bead on edge of this magnet cover is made with "Fleetweld 7."

The above is published by LINCOLN ELECTRIC in the interests of progress. Bul. 403 gives procedures for the electrodes mentioned. For a free copy write The Lincoln Electric Company, Dept. 175, Cleveland 1, Ohio.

NEW LITERATURE

Use the Coupon on Page 146

252—Septic-Tank Systems

Circular Series G5.5—6 pages—covers septic-tank systems, essential parts, how system operates, construction chart (materials and mechanics), size and design, home built or ready-made, maintenance, sewer lines, and disposal lines.—*Small Homes Council, University of Illinois, Mumford House, Urbana, Ill.*

253—Data and Reference Table

A 16-page manual includes clocking table for one revolution of meter test hand, orifice, discharge rates, flow capacity of standard steel pipe and fittings, flue pipe sizes, and conversion burner inputs.—*Budco, Inc., 13415 Gratiot Ave., Detroit 5.*

254—Electric Hammer and Drill

A catalog sheet covers the Do-All combination electric hammer and drill, with tools for working on metal—cold chisels, beading and seaming tools.

Another sheet covers the "Do-All" star drills for drilling holes in concrete, brick and stone, with diameters from $\frac{1}{4}$ to $1\frac{1}{2}$ inches.—*Wodack Electric Tool Corp., 4627 W. Huron St., Chicago 44.*

255—Fan Data

A folder being distributed offers technical data on the Miles variable fan speed modulator—a device with thermostatic means to open and close a split pulley on the motor shaft which is connected to the fan pulley by means of a V-belt.

The modulator functions in correlation with the return air temperature. To graduate the air volume in accordance with the return air temperature, the heat delivery is graduated to the house as a whole.—*Miles Heating Enterprises, Cleveland 15, Ohio.*

256—"Compressed Air Handbook"

"Compressed Air Handbook", first edition, 400 pages, 6 x 9 inches, 247 illustrations, including photos and drawings; stiff-backed, simulated leather cover, gold embossed; price, postpaid, United States, \$3.00 per copy; elsewhere \$3.50.

Compressed Air Handbook is published to meet widespread demands for a reference text on applications, installation, operation and maintenance of compressing equipment and air-powered tools of all types.

The object was to provide a comprehensive volume of reference data which would meet technical and engineering needs and serve the layman and student with information on the wide versatility, flexibility and utility of modern compressed air power.

Compressed Air Handbook represents the collective knowledge, experience and thought of the 19 member companies of the Compressed Air and Gas Institute, and was compiled over a two-year period as a joint activity of the Institute's educational and technical committees.—*Compressed Air and Gas Institute, 1404 Terminal Tower, Cleveland 13.*



OIL HEAT IS MODERN HEAT!



When you install an oil burner, make sure that you install the VENTALARM® Signal too. This is the audible fuel oil tank fill signal that makes fuel oil delivery completely automatic.

During delivery, the VENTALARM Fill Signal emits a whistling sound, clearly audible to the driver through the vent pipe terminating out of doors. Whistle stops when the tank is filled to the proper level—no guesswork, no spillage, no waste, no delay.

Home owners like VENTALARM's assurance of "come and go" freedom—they needn't even be at home for oil delivery. The driver never invades the privacy of the household.

Over a million oil-heated homes coast to coast are now VENTALARM-equipped.

PURCHASE AT YOUR FAVORITE SUPPLY HOUSE
or contact us for full information

SCULLY SIGNAL COMPANY
Cambridge, Mass.

VENTALARM
UL REG. U.S. PAT. OFF.
Whistling TANK FILL SIGNAL

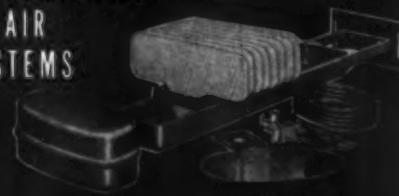
Canadian Licensee: EMPIRE BRASS CO., LTD., London, Ontario

Be A Blower Dealer

Convert any gravity furnace into a modern forced-air heating plant with the Viking Blower Package. Engineered for quick, easy installation... quick, certain profits for you.

ANOTHER Viking PROFIT BUILDER

SERIES 1100 HUMIDIFIER
FOR FORCED AIR
HEATING SYSTEMS



A companion package that makes your conversion job a complete WINTER AIR CONDITIONING SYSTEM. Designed to fit all types of furnaces. Complete data in Bulletin 349.



AUTOMATIC WATER PAN FILLER FOR USE ON ANY FURNACE

A complete package. Carry one at all times. Quickly, easily installed. Helps make an inspection trip a profitable call.

Viking

AIR CONDITIONING CORP. 5600 WALWORTH AVE.
CLEVELAND 2, OHIO

WITH THE CONTRACTORS

Contractors are invited to write and tell us about their new shops, new locations, new store fronts, display windows, changes in management, etc. Pictures will be appreciated and returned, if requested.

Contract has been awarded for construction of an addition to the sheet metal shop of the Slauson Avenue Sheet Metal Works at 1863 West Slauson Avenue, Los Angeles. The wood frame and sheet metal structure will add an area of 60 x 69 feet to the plant.

The Bakersfield Hardware Company of 2015 Chester Avenue, Bakersfield, Calif., announces the opening of a new sheet metal department to handle all kinds of sheet metal jobs, large or small. The shop is at 731 Sixteenth Street, Bakersfield, and is under the management of Aaron E. Abbott, who gained his wide experience in various sheet metal shops in that city.

The company operates a large refrigeration department, handling a complete line of Frigidaire products, Ward floor furnaces, Payne duct furnaces and central heating systems.

J. J. Mirabile, formerly with Harold E. Sweeney Corporation of Philadelphia, has recently joined Elliott-Lewis Co., Inc., Delco-Heat Division, 2518 N. Broad Street, Philadelphia, distributors in Philadelphia and suburbs of fuel oil, oil burners, heaters, rockwool insulation, storm windows, screens, metal awnings and jalousies.

Air-O-Matic Heating and Ventilating Company is a new corporation in San Diego, California, with a capital of \$25,000, and the following directors:

Ernest W. Teubner and Mayne B. Teubner, both of 4743 Fifty-fifth Street, San Diego, Calif.; and William R. Stacey of 4450 Forty-ninth Street, San Diego.

The new corporation is represented by Ben B. Rubin, 819 Bank of America Building, San Diego.

D. E. Hickey, a heating contractor of 5230 Baum Boulevard, Pittsburgh, won a second prize of fifty dollars in the Bryant Heater Company's recent photo contest for persons engaged in the specification, sale or installation of Bryant equipment.

A third prize of twenty-five dollars went to Henry Bauer, Belleville Sheet Metal Works, Belleville, Illinois.

The purpose of the contest was to encourage the trade in "Call-backs" on users of gas-fired heating equipment, with a view to building repair and replacement business.

Edward L. Pratt, roofing and heating contractor, Slingerlands, N. Y., is getting set up for the manufacture of aluminum furniture, and at some future date, boats and toys, one at a time. From personal experience, he likes to handle aluminum because of its light weight and appearance of the finished products.

Gas Lamp Replicas

WHEN a six-year old boy, Tim Lewis, came to Gallipolis, Ohio, in 1883, he marveled at the big street lights—eight windowed things framed in metal and suspended in hoops atop poles at street and intersections and in midblock.

Nearly 65 years later Tim Lewis had manufactured more than five times as many replicas of the old gas lamps as the city had in his childhood. Since the original lamps were found 14 years ago in the old firehouse where the City Hall now stands, Tim has made five hundred copies of them and they have been sold to customers in most of the states and in at least one foreign country.

In his shop a short distance above the upper corporation limit on Route 7, Tim is now concentrating all his energies on the production of lamps in three sizes:



the large three-foot tall exact replica of the original; a smaller five-window lamp, and a still smaller four-window lamp. Samples of these lamps are perched atop poles in Lewis' shop yard. The smaller ones are wholly "out of my own head," Tim said.

Framed in a special tin-painted one side, the lamps are now set up for electricity. But Lewis has to scour the hills and valleys of West Virginia to get brass lamp wick bases into which he inserts the sockets for incandescent bulbs.

This little man "five feet four" who has spent 57 years as a sheet metal worker, cuts out 50 of the lamps at a time, completes about 10 a month. Tim works from 7 a.m. till 11 a.m., goes down town to relax a bit, returns to his shop at 1 p.m. and works on lamps till 4 p.m. After he cuts the frames, the work of joining the pieces is done by soldering. The glass cutting and fitting is done by the J. Howard Neal hardware.

The first metal work Tim Lewis ever did was the manufacture of rainwater cutoffs in the old Ohio River-view Hotel. That was 1890, when Tim was 13 years of age, and he was an employee of 65-year old A. R. Chase, "biggest roofer in town."

Born November 7, 1877, in a dirt floored log cabin on the George Washington grant on the lower side of the Kanawha River, five miles above the Ohio River, Tim came to Gallipolis, Ohio, on the steamer Clara Belle.

Tim has been operating in his present location for two years. For four and one half years he was in war work at the Marietta Manufacturing Company. Prior to that he had operated his metal shop on State Street.

MANUFACTURERS!

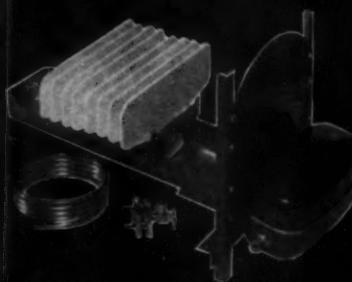
Viking
EFFICIENCY



Puts Quality
in Your Furnace

Viking Blower assemblies are recognized by the entire industry as the most efficient, trouble-free unit ever developed. And, the complete unit costs less than one you, as a furnace manufacturer could build or assemble yourself.

Viking Dependable Humidifiers
Add Winter Air Conditioning
to Your Furnace



SERIES 1300
FOR POPULAR
SIZED FURNACES

A complete float operated humidifier especially designed for small plenum installations. Incorporates the famous Viking Top Seat float valve for longer, trouble-free service under all conditions. Bulletin 349 contains complete data.

Write Today for
Viking
BLOWER CATALOG

Contains complete specifications on blower units for any size furnace at any capacity.



Viking



AIR CONDITIONING CORP. 5600 WALWORTH AVE.
CLEVELAND 2, OHIO

GIVE YOUR CUSTOMERS THE ADVANTAGES OF FAST RECOVERY...

ON
**HOT WATER
SUPPLY**



ALDRICH

FIRE-TUBE

WATER HEATERS

Where a hot-water supply system has too slow a recovery rate to take care of residence or commercial demands adequately, an Aldrich Water Heater Unit will often solve the problem. Even the smallest model...with a case 20" in diameter and 50" high and a burner rated at 1.3 gph maximum...will deliver 125 gph of 140° water continuously. The burner runs whenever necessary to maintain required temperatures. Aldrich Boilers and Burners are matched for maximum efficiency, designed for performance, and built for durability and reliable service.

WIDE RANGE OF CAPACITIES

Aldrich Water Heater Units come in 6 sizes with a rated range of capacities from 125 to 850 gallons of 140° water per hour. All Aldrich units are of the fire-tube type.

ALDRICH OIL BURNERS

The widely-favored, skilfully-engineered, dependable Aldrich Burners are made in 3 types and 5 models with capacities ranging from .75 gph to 19 gph.

Write today for complete data and price lists

ALDRICH COMPANY

OIL BURNERS • BOILER BURNERS FOR HEATING AND DOMESTIC WATER SUPPLY

111 EAST WILLIAMS ST., WYOMING, ILL.



OVER
40,000
IN USE



NEW LITERATURE

Use the Coupon on this page

257—Allegheny Stainless in the Dairy Industry

Allegheny Metal in the Dairy Industry covers applications, performance records, and information on corrosion resistance, physical properties, fabricating procedures, and forms of stainless available.—Joseph T. Ryerson & Sons, Inc., Box 8000-A, Chicago 80.

258—Aerofuse Damper No. 4

A six-page bulletin describes the Aerofuse Damper No. 4, designed for use with Aerofuse ceiling diffuser for control of air distribution on heating, ventilating and air conditioning systems. Complete description and prices of ten damper sizes are included. Engineering data gives details and dimensions of damper, operator and installation information.—Tuttle & Bailey, Inc., New Britain, Conn.

259—PoweRated Series

Bulletin No. J-3 covers J & C PoweRated equipment—both forced air and gravity winter air conditioning units—for hand or stoker firing, gas or oil, and with air volumes from 3,000 cfm to 75,000 cfm, and from 380,000 up through 3,800,000 Btus per hour. Construction is covered, performance features are enumerated and the engineering department advises on curing and drying problems.—Jackson & Church Company, Saginaw, Michigan.

260—Temper Designations

Rapid metallurgical advances and improved fabricating techniques during the past few years have served to magnify the inadequacies of the present temper designation system for aluminum and the aluminum alloys. To overcome such inadequacies and to provide a definite pattern for future developments, a revised system of aluminum alloy temper designations has been developed by Alcoa. This new system, based on manufacturing techniques, becomes effective on all Alcoa shipments made on and after January 1, 1948.—Aluminum Company of America, Pittsburgh 19.

American Artisan,
6 N. Michigan Ave.,
Chicago 2, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "Equipment Developments" and "New Literature." (Circle numbers in which you are interested):

168	169	170	171	172	173	174
175	176	177	178	179	180	181
182						
246	247	248	249	250	251	252
253	254	255	256	257	258	259
260						

Name

Company

Address

Are you manufacturer? Jobber? Dealer?

Brundage

GIVES YOU . . .

- QUIET OPERATION
- DEPENDABLE PERFORMANCE
- EASY INSTALLATION

IN SERIES 200 AND 300 BLOWER CABINETS



Send for complete description and specifications of Series 300, The Economy Unit, and Series 200, the DeLuxe Unit, Brundage Blower Cabinets.

You get quiet operation in a Brundage Blower Cabinet because the blower is designed right and made carefully of high quality materials. The fan wheel is hot riveted to the hub and the blades are hot riveted to the wheel. The shaft runs in self-aligning pillow blocks making the whole assembly rigid, smooth-running and vibrationless. Nationally known makes of motors are used.

And you know that when you install a Brundage Blower, it will continue to give quiet, dependable service for years to come because Brundage uses heavier materials, designs Brundage Cabinets for greater strength and longer life. Better construction makes Brundage Cabinets easier to install, too, because dimensions are accurate and all parts fit together easily.

Install Brundage for customer satisfaction and greater profit.

THE
Brundage
COMPANY

Blower Specialists
Since 1919

503 NORTH PARK STREET
KALAMAZOO 11, MICHIGAN



HACKER
STANDARD HEATING EQUIPMENT CO.
WATERLOO, IOWA

GREATER DEALER PROFITS!

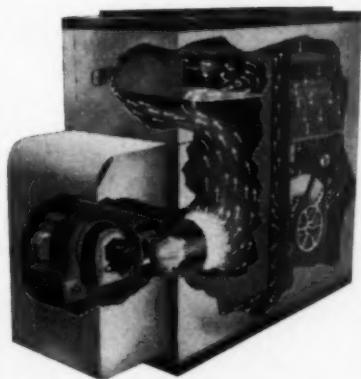
★ LOWER COST TO YOU . . . production line assembly.

★ PACKAGED UNIT . . . no set up required.

★ EASILY SERVICED . . . all standard parts used.

Can be delivered to average basement completely assembled. Where necessary canopy and burner can be removed in a matter of minutes reducing length to 4 feet.

HEAVY STEEL BOTTOM eliminates cementing.



SHIPPED COMPLETE WITH: Gun Type Oil Burner (Underwriters approved). 12" Blower (with motor). Stainless Steel Comb. Chamber. Standard Size Filter. Automatic Drip Humidifier. Automatic Draft Regulator. Thermostat, Stack Switch. Comb. Fan & Limit Control.

SPECIFICATIONS:

Length overall	62 in	Height	52 in
Width	24 in	BTU Cap. (at bonnet)	100,000 525 lbs

Manufactured by

STANDARD HEATING EQUIPMENT CO.
Waterloo, Iowa

Some sale territories
open — Write for
descriptive litera-
ture and prices.

EQUIPMENT DEVELOPMENTS

Use Coupon on page 146

180—Oil-Burner Motor

An electric motor for oil-burner application has been designed. This new motor, the C1604-25, is a 1/6 hp split phase type, designed to operate on 115 volts at 60 cycles with a constant speed of 1725 rpm.

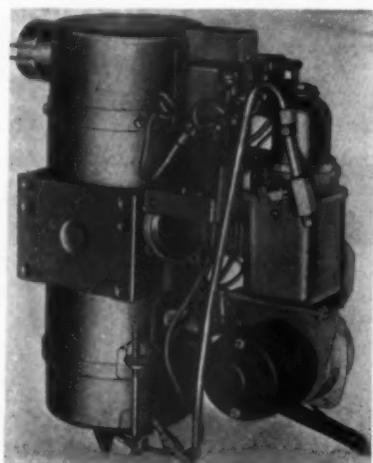


A manual reset overload protector is built in.

The motor is particularly suited to gun-type burners. It is totally enclosed with optional rotation, and standard NEMA two-lug mounting flange.—*Jack & Heintz Precision Industries, Cleveland 1.*

181—Engine Heater

The Superflex engine heater has been designed for installation on practically all types of motor power—as a stand-by heater when the equipment isn't in use, or as an



auxiliary heater on the moving vehicle. Five models are available.

This heater works by heating the engine coolant. Also, by utilizing the heat from exhaust gases and by adding a hot air or liquid heat exchanger, the heat generated serves to warm the oil, battery, cab, etc. It operates independently of the engine.—*Perfection Stove Company, 7609 Platt Avenue, Cleveland 4.*



182—HomEase Burner

A new oil burner model, designated the HomEase TMO-A, is a small burner of $\frac{3}{4}$ to 1.5 gph capacity.

The TMO-A HomEase is equipped with the "Flame Shape Control," which regulates the flame to the size and shape of the fire-box. The "Fire-Stat," automatically providing one kind of air-and-oil mixture for a cold start, and another for normal running with fire-box hot, may be fitted to the TMO-A, but is not furnished as standard equipment.

—*HomEase Products Division, Inc., (A Division of Bogue Industries), 52 Iowa Avenue, Paterson, New Jersey.*

Self FLUSHING! Self CLEANING! AUTOMATIC CLEANING NOW POSSIBLE IN THE NEW SKUTTLE HUMIDIFIERS

IT'S TRUE! Skuttle Automatic Humidifiers (Series 600*) are completely self-flushing, completely self-cleaning! All you do is raise the fingertip control switch to flushing position and Skuttle's new exclusive vacuum-controlled cleaning system does the rest . . . flushes the entire unit, drains off all water, sludge, mud and mineral deposits, then automatically trips off to allow unit to refill again to valve adjustment level! No hand scraping required, no clean-out panel necessary! Simple, convenient, foolproof!

The series 600 saves you installation time over any other type of humidifier.



OTHER IMPORTANT SKUTTLE "600" FEATURES

- ★ Drawn seamless copper pan (3" x 12").
- ★ Replaceable VAPOGLAS* evaporating plates.
- ★ 5 plates furnished. Evaporating area 316 sq. in.
- ★ Automatic anti-siphon float control valve.
- ★ Collar fits sloping or vertical bonnets.

See your local jobber or write today for state listings and the complete Skuttle story!

Skuttle

MANUFACTURING CO.
4099 BEAUFAIT, DETROIT 7, MICHIGAN

ONE-STOP BURNER SERVICE



John Zink Announces The NEW No. 50 "Shorty" FLOOR FURNACE

50,000 Btu/hr. A.G.A. Approved

This new No. 50 Floor Furnace is especially designed for installation where under-floor space is limited. It is only 25" deep. Burns natural gas, mixed gas, manufactured gas or L. P. gas with equal efficiency.

Write for Literature

John Zink Company

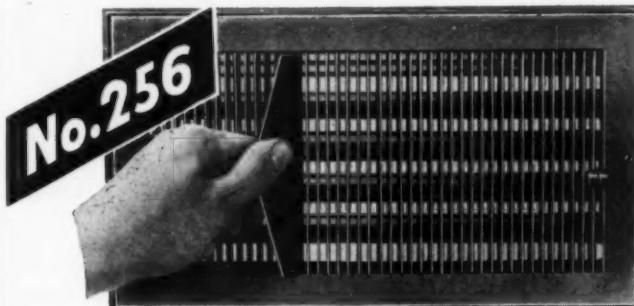
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New York - Salt Lake City - Houston - Los Angeles



To Buy Your Complete
Lines From ONE Source



4-WAY FLOW AIR-CONDITIONING REGISTERS

Whatever the kind of opening in your heating system plans—baseboard, sidewall, or floor—there are "families" of U. S. Registers to give you a perfectly matched installation for the entire home. False inducements may trap some contractors into buying single-style brands for jerry-built jobs, but the contractors who are looking forward to many years of successful operation are securing that future NOW by sound register selection to which they can always point with pride.

The No. 256 4-Way Flow A-C Registers, in the various styles, are the finest for your high class contracts. No. 153 A-C Registers meet all requirements for the less pretentious homes.

The No. 40 Series gives you a beautiful register for baseboard use on either gravity or forced-air systems—and teams with No. 240 for sidewall use.

In Floor Registers, U. S. provides No. 400 Trussteel for heating outlets and the No. 405 for cold air returns.

You can keep your inventories down and save installation costs by standardizing on U. S. Registers. A letter will bring you the most complete catalog in the register industry.

All Completely Covered By
U. S. CATALOG NO. 47
Send for your copy TODAY

UNITED STATES REGISTER CO.
BATTLE CREEK, MICHIGAN
MINNEAPOLIS • KANSAS CITY • ALBANY

THERE'S
A
Draft-O-Stat
FOR
EVERY
REQUIREMENT

MODEL "B" DOMESTIC
— new design

The new Model "B" Draft-O-Stat represents the latest achievement in precision combustion control for the small heating plant. Adjustable counter-weighted flutter controls draft barometrically, saving fuel, reducing smoke and soot, and improving furnace operation. Two sizes, to fit flue pipes from 6" to 9".



**MODEL "A"
DOMESTIC**

The original Draft-O-Stat for automatic control of chimney draft in furnaces and boilers. Adjustable counterweight provides precision control of draft. Available with or without thimble. Nine sizes, 7" to 20".

COMMERCIAL

For use in apartment buildings, hotels, schools, small factory and office buildings. Can be used on natural-draft or motor-driven oil burners, hand-fired boilers, stokers, and forced-draft installations. Available with or without hand control. Four sizes, 16", 18", 20" and 24".



INDUSTRIAL

Sturdily built heavy-duty draft control for large heating plants. Available with or without breeching plate and thimble, and with or without locking device. Like other Draft-O-Stats, it pays for itself in most cases, out of one year's fuel savings. Three sizes — 24", 30" and 36".



Write for descriptive literature

THE HOTSTREAM HEATER CO.
6917 Quincy Avenue • Cleveland 4, Ohio

Manufacturers of water heaters and draft controls

WITH THE MANUFACTURERS

Official approval has just been granted by the American Gas Association for the use of liquified petroleum gas (L-P gas) in all Surface Combustion Janitrol gravity furnaces (GCS line) and winter air conditioners (FAC line) at full catalog ratings.

Trion, Inc., Pittsburgh manufacturers of electric air filters, have appointed Lt. Colonel W. Allen Stone as regional sales manager for Cincinnati.

Colonel Stone, who until recently served on loan to the National Housing Agency as Engineering Consultant, is returning to Cincinnati to continue his work in the housing and industrial field.

Prior to returning to this country and during World War II, Colonel Stone served on the staff of the President of Peru in an engineering capacity.

Production facilities of the Morrison Steel Products, Inc., Buffalo, N. Y., manufacturers of Mor-Sun Warm Air furnaces, will greatly increase upon completion of a building expansion program now under way.

A major part of the program is the addition of 50,000 square feet of floor space which will bring to over 210,000 square feet the amount of factory floor space exclusive of offices available for increased Mor-Sun furnace production. The new addition, of structural steel and cinder block construction, will be directly connected to the present factory building.

A. F. Boucher, welding engineer for The Lincoln Electric Company, handling special accounts in the Detroit area, has been transferred to become district manager for the Milwaukee office at 733 N. Van Buren St., Milwaukee, Wisconsin. Mr. Boucher served in the Army from 1942 to 1945 in the Armor and Welding Section, Engineer Branch, Office Chief of Ordnance. This office was responsible for all welding and armor specifications for tanks, combat vehicles and aircraft.

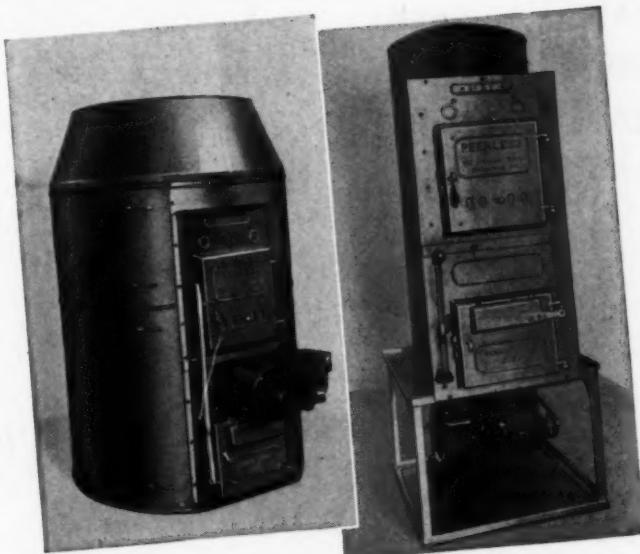
Marshall Ford has been made district manager for The Lincoln Electric Company's Minneapolis office at 529 So. 7th St., Minneapolis, Minnesota. Mr. Ford has been a welding engineer for The Lincoln Electric Company since 1941 in the Pittsburgh district.

On Friday night, August 22, Kresky Mfg. Co., Inc., Petaluma, California, suffered a total loss by fire of its Plant No. 1. A. J. Matot, vice-president, stated: "We were fortunate, however, in having our new and enlarged quarters known as Plant No. 2 better than two-thirds in operation. The fire retarded our operation for approximately ten days, but we are again in full production."

Wheeling Corrugating Company, Wheeling, W. Va., has announced the retirement of E. C. Schaaf, manager of the Atlanta office, because of ill health, and the appointment of W. C. Gemperline, as his successor. Mr. Gemperline moves to Atlanta from Columbus, Ohio, where he has served since 1938 as a salesman, with the exception of two years in the armed forces in the South Pacific.

TWO NEW PEERLESS FURNACES

IDEAL FOR SMALL HOMES!



COMBINATION

HIGH-BOY

At left: The Peerless Combination, with automatic Breese oil burner installed. Even with burner installed, if need be it can be fired with coal. At right: The Peerless High Boy with case removed. Dimensions, 27"x30". Height, 6'. For utility room use here's your best buy.

Here are the two latest Peerless Steel Furnaces for use in the smaller home . . . *designed* to sell fast and serve efficiently . . . *priced* to build bigger-than-ever profits for you! Engineered and built by Peerless master craftsmen, these all-new warm air heating units are:

THE PEERLESS HIGH BOY—Designed for utility room or where space is limited. Blower at bottom forces all available heat up through warm air registers. Oil burner can easily be installed for automatic heat.

THE PEERLESS COMBINATION—For either coal or oil operation. Can be hand-fired even with burner installed. Combustion chamber and radiator of arc-welded, steel boiler plate assures peak heating efficiency and maximum life. Economical, dependable, easily installed.

Write or wire for full specifications, prices and other details on these and the many other fast-selling, efficient furnaces in the complete Peerless line!

PEERLESS FOUNDRY COMPANY

1853 Ludlow Ave. • Indianapolis, Indiana

Extra Profits In Blower Installations

with

Vent-Air

General Purpose
CAST ALUMINUM
UTILITY BLOWERS

V-5—6" (less motor) - - - \$19.00 Net
V-10—7" (less motor) - - 24.00 Net
V-20—9" (less motor) - - 36.00 Net

SIZE	INLET	OUTLET	WHEEL DIA.	CFM	REC RPM	REC HP
V-5	6"	6"	6 1/4"	550	1750	1/4
V-10	7"	7"	7 1/4"	1180	1750	1/2
V-20	9"	9"	9 1/4"	2280	1750	3/4 or 1

Blowers are of light weight, sturdy, cast aluminum—non-sparking. Standard diameter inlet and outlet—fit stock size pipe. Adjustable base—fits any standard motor. Adjustable discharge—rotates to four positions. Wheel statically balanced.

MAXIMUM AIR DELIVERY • MINIMUM OVERALL SIZE AND WEIGHT



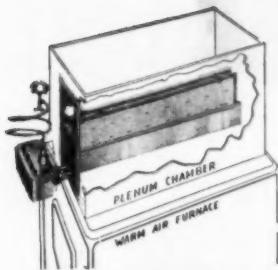
Installed with used or new motors—VENT-AIR provides a compact, efficient blower set that permits you to make a good profit for your time and trouble. Order a VENT-AIR today. Send purchase order or cash. Shipped F.O.B. Detroit.

Fried Air-Kool Co.

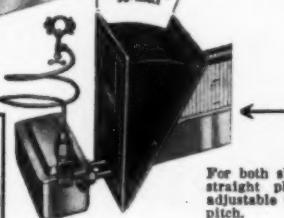
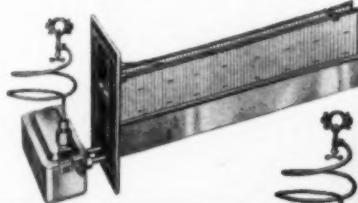
8205 LYNDON
DETROIT 21, MICH.

FOR VITALIZED HEAT USE *Convector* HUMIDIFIERS

**AUTOMATIC
FAST-ACTING
HIGHLY EFFICIENT
EASY TO INSTALL.
EASY TO SERVICE!**



Showing proper installation of a 2-Trough "CONVECTOR" Humidifier on an Air Conditioning unit... straight-side mounting.



FEATURES

- 1 Evaporates MORE water with minimum of air flow restriction.
- 2 Water reservoir located away from heat of the furnace.
- 3 Non back-siphoning water feed valve fully approved by National Plumbing Laboratory.
- 4 Furnished complete with 6' of copper tubing, saddle valve, fittings, and installation instructions.

Come to HUMIDITY HEADQUARTERS

Maid-O-Mist manufactures a complete line of humidifiers, humidifier valves and accessories. It pays to handle all of this high-grade, yet low-priced equipment. Write us, or see your jobber!



3213 N. PULASKI RD.
CHICAGO 41, ILLINOIS

Leading the Field

MULKEY

Manufacturers of
Oil and Gas
Floor Furnaces

Conversion Burners

Oil-Trailer Heaters
and Room Circulators



TRAILER HEATERS



FLOOR FURNACE

Oil FLOOR FURNACE

IN THE LONG RUN

EXPERIENCE AND PERFORMANCE COUNT

WHOLESAVERS • DEALERS • BUILDING CONTRACTORS

Write or wire today for immediate delivery

J. F. MULKEY CO.

12626 WOODROW WILSON • DETROIT, MICHIGAN

23 YEARS OF EXPERIENCE IN DESIGN AND MANUFACTURING

WITH THE MANUFACTURERS

Harold F. Dean, well-known heating engineer and former member of the Stoker Manufacturers Association Engineering Committee has been appointed director of research for the Conco Engineering Works.



Harold F. Dean

the company as sub-contract executive coordinating all outside purchases of materials.

As director of research, Mr. Dean will coordinate and supervise research and new development on Conco's commercial and domestic stokers, gas and oil-fired winter air conditioners, conversion oil burners, and hand-fired furnaces. Much of Mr. Dean's efforts will be to further the progress of the new Conco-Breese Horizontal Oil Burner, now in mass production, a revolutionary new burner which is readily adaptable to water heaters, cooking ranges, space heaters and warm air furnaces.



Philip C. Johnson

Philip C. Johnson of Euclid, Ohio, has joined the Harvey-Whipple field organization as Master Kraft Oil Heat sales representative covering the States of Ohio and Kentucky. He has for the past three years been sales manager of the State Supply Company of Cleveland, and for seven years before that covered mid-west territories for Bird & Son.

Dual Press Company, St. Louis, manufacturers of the all-steel Dual Brake Press for bending, forming, blanking and multiple punching, has announced the appointment of Machinery & Welder Corporation, St. Louis, as national wholesale distributors for sales and servicing of Dual Brake Presses. The new sales and service organization is to be known as the Dual Brake Press Division of Machinery & Welder Corporation.

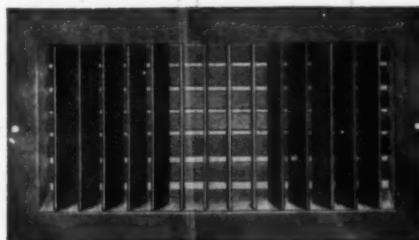
The Dual all-steel Brake Press is manufactured in six series and 30 different sizes with capacities ranging from 5 feet of 16 gauge to 20 feet of $\frac{1}{2}$ inch steel plate.

YOU CAN GET IT QUICKER FROM
STEWART

QUICK FACTS ABOUT HIGH VELOCITY OUTLETS MADE BY STEWART

The styles illustrated are typical examples of improvements in the Stewart line of Outlets, Wall and Baseboard Registers, Scoopaires and Radiator Fronts. All have been redesigned for smarter appearance, better diffusion and more flexible adjustment. The Stewart line is competitively priced and includes a wide range of popular types and sizes of outlets for air-conditioning, heating and ventilating. Special types and sizes can be made to your specifications.

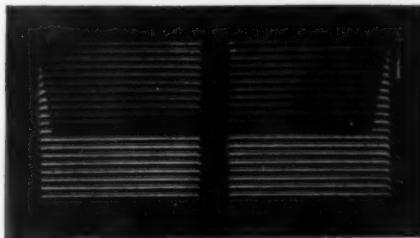
PROMPT DELIVERIES ON STANDARD SIZES



STYLE DDV

(2 Banks)
Individually
Adjustable
Face and
Rear Bars

Style DDV is one of 8 variations of Stewart High Velocity Outlets. By means of a detachable key, all bars are adjustable for directing air straight and at various right-left or up-down angles. Style DDV has vertical face bars and horizontal rear bars. Style DDH (not shown) has horizontal face bars and vertical rear bars. This type of outlet is made in popular sizes with or without lever-operated, multiple volume valves. Matching intakes are available. OUTLETS CAN BE SUPPLIED TO FIT CONTOURS OF CABINETS FOR ROOM COOLERS.



STYLE 91

Lever-operated
Single Damper
Wall Register

STYLE 91 is from the series 70-90 of Wall and Baseboard Registers made with single dampers, or multiple-valve dampers, both lever operated. Face bars of the 90 series are horizontal and set down at a 22 degrees angle. Face bars of the 70 series are vertical, set straight. Setting keys are furnished for user to alter bar settings. Matching, fixed bar grilles are available.

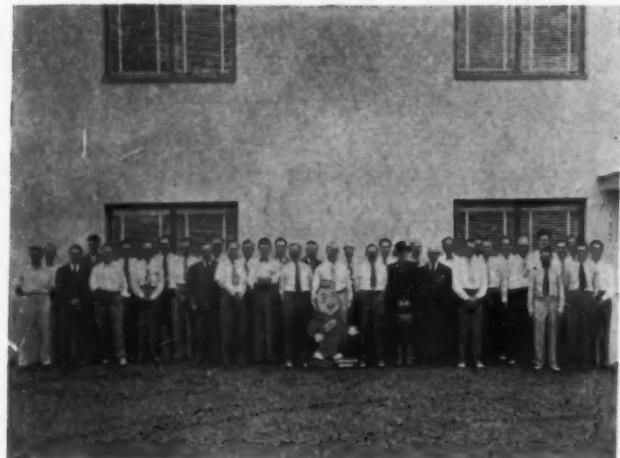
Send for literature and prompt quotation on your requirements

STEWART MANUFACTURING COMPANY
INCORPORATED

612 Bloomfield Avenue

Bloomfield, N. J.

WITH THE MANUFACTURERS



Scene At Norman Meeting

Introduction of the Norman Southerner highlighted the second annual sales meeting of distributors held August 15th and 16th by the Norman Products Company at their plant in Columbus, Ohio.

The distributors who attended the two day session were enthused about the multitude of heating adaptations of this "pint size" unit which is AGA Approved for natural, mixed, manufactured, LP-Gas, and is available as an automatic forced air furnace, or with

a nozzle for installation as a self-contained unit heater.

Paul B. Sagar, sales and service education engineer, outlined for Norman distributors the engineering and construction detail of the Southerner as a new approach to the problem of providing efficient and low cost automatic gas heat for small buildings. Harry Gibbard, chief engineer, discussed duct work computation and the advantages of the Southerner for low-cost heating installations for small homes, factories, service stations, warehouses and other types of small buildings.

The Norman Southerner is now being manufactured in two sizes: Model 60 with 60,000 Btu input and Model 30 with a Btu input of 30,000.

The Meyer Furnace Company of Peoria, Illinois, has recently made two important personnel changes. Frank H. Schryer has been appointed superintendent of the Meyer plant at Peru, Illinois. Mr. Schryer came to Meyer from the L. J. Mueller Furnace Co. where he had been general superintendent.

Ray W. Qualley was made chief product design engineer by Meyer Furnace. In this capacity Mr. Qualley will have charge of the development of new automatic heating equipment as well as application of latest developments to present products.

The J. P. Ashcraft Company of 2826 Fondren Drive, Dallas, Texas, has been appointed sales representative in the North Texas territory for the Research Products Corporation of Madison, Wisconsin.

The Madison firm manufactures air filters, water treating minerals, and expanded fiber products.

For BETTER SHEET METAL WORK PEXTO'S *your answer*



SCROLL SHEARS

Modern demands for Sheet Metal Fabrication which include refinement of design, greater accuracy and clean-cut, faster production, require the best of machinery and tools.

The PEXTO line answers all requirements . . . for all operations . . . makes it easier to produce first quality work at lowest costs.



MOTOR DRIVEN
COMBINATION ROTARY MACHINES

THE PECK, STOW & WILCOX COMPANY Since 1785 SOUTHBURY, CONNECTICUT, U. S. A.

FRONT RANK GRAVITY FURNACES



- 1 LOWER GRATE LEVEL—Better for Stokers.
- 2 LOWER FEED DOOR—Easier to hand-fire.
- 3 LONGER DISTANCE ABOVE FEED POUCH—for Greater Radiation.
- 4 RE-DESIGNED DUPLEX GRATES—Easier to install.
- 5 RE-DESIGNED FRONT—Fits either square or round units.
- 6 ALL SHIELDED ARC WELDED CONSTRUCTION.
- 7 BOILER PLATE STEEL, No. 7 GAUGE HEAD—No. 8 body.
- 8 CAST IRON RADIATOR COLLAR, TONGUE & GROOVE CONNECTION.



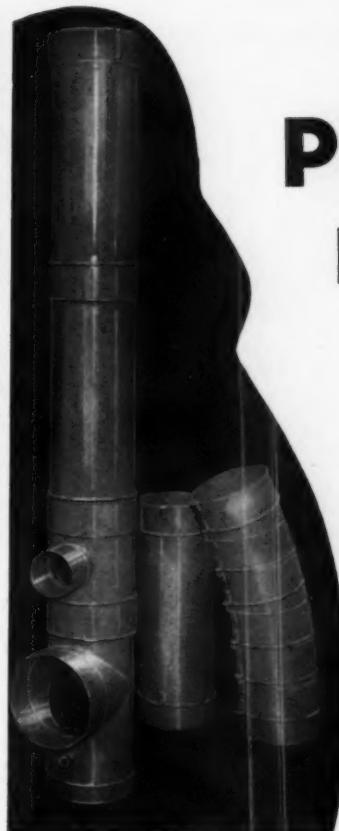
The FRONT RANK coal fired furnaces, for hand or stoker firing, meet all demands for heavy duty and economy. They're easy to install, have high B.T.U. rating and give years of trouble-free service. With improvements mentioned above, this SERIES remains the backbone of our production and are the post-war models for leadership—and profits.

ORDER from YOUR JOBBER.

FRONT RANK FURNACE CO.
DIVISION OF LIBERTY FOUNDRY CO.

2500 OHIO AVE., ST. LOUIS 4, MO.

EXTRA PROFIT For You



Install
VITROLINER
CHIMNEY
LINING

Dealers—You can quickly build up a thriving business lining old or new masonry chimneys—ideal for gas or oil fired heating plants where protection against acid bearing condensation is important.

VITROLINER insures longer life to the chimney—increases stack temperature (heats and cools quickly) providing better draft to carry gases out of chimney.

VITROLINER is made of heavy gauge steel completely coated inside and out with acid resisting porcelain fused into the steel at 1575° F. to prevent corrosion. VITROLINER drains the condensate harmlessly away into the ground preventing deterioration of brick work.

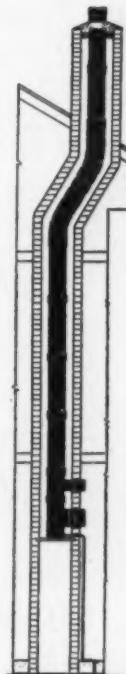
VITROLINER can be installed in a few hours. It will correct DEFECTIVE LINING, SMOKE BACK, LEAKY BRICK JOINTS, and POOR DRAFT.

VITROLINER has been used for the past 18 years and is proven through a long field record.

We invite correspondence from reliable dealers who can contact and service installations in a few still available cities.

Write today for literature and prices.

CONDENSATION ENGINEERING CORPORATION
122 S. MICHIGAN AVE. CHICAGO 3, ILL.



SIGNAL

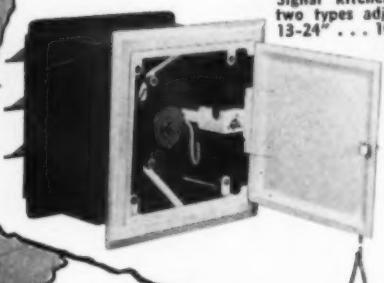
MANUFACTURERS OF ELECTRICAL PRODUCTS

EXHAUST FANS

For commercial use in kitchens, laundries, taverns, garages, and similar installations where a large volume of air is required, Signal Bucket Blade Exhaust fan does the job efficiently, quietly and economically. Ask for details.



VENT FANS



Signal kitchen vent fans are two types adjustable—6-11½" 13-24" . . . 10" quiet type fan . . . motor rubber mounted—totally enclosed . . . double protection outside shutter; inside door . . . can be installed in new or old houses.

ELECTRIC DRILLS

Signal Electric Portable Drills in models for light and standard duty. In addition to drill illustrated, OB-8 ¼" drill for light duty and OB-5 ½" drill for standard duty. This drill has everything you expect in a good drill . . . power, proper speed, correct balance, high quality construction. Ask for drill catalog and price information.



SIGNAL ELECTRIC MFG. CO.

MENOMINEE, MICHIGAN
Offices in all Principal Cities

WITH THE MANUFACTURERS

Partners A. L. Swartzmiller and M. A. Davies of Guardian Sales Co., Chesaning, Michigan, have been appointed manufacturers' representatives for the Nu-Way "XL" line of oil burners in the entire state of Michigan.

Mr. Swartzmiller has been in the heating and plumbing business nearly twenty years, with wide experience in both the retail and manufacturing business. Mr. Davies, while new to the heating field, has been active in sales in the automotive field.

A service kit designed as one compact, easy to carry package has been made available to oil-burner service men by the Service Department, Heating and Appliance Division, Evans Products Company, Plymouth, Michigan.

The kit contains all the equipment necessary for field service calls on oil-burning space heaters and water heaters. Tools and gauges are packaged in a light-weight, sturdy canvas kit which wraps into a roll for easy handling. Contents of the kit include draft gauge, graduated glass cylinder and beaker for measuring oil flow, clean out rod and brush, and wrenches and screw-driver. The kit is available to dealers through distributors of Evans domestic heating equipment.

Lawrence F. Neely is now district manager for the Southwest territory of Duo-Therm division of Motor Wheel Corporation, Lansing, Mich. In this post he succeeds E. M. Crary, recently promoted. The territory covered includes Colorado, New Mexico, Nebraska, Oklahoma, Texas and Wyoming.



Lawrence F. Neely

Mr. Neely has an extensive background in merchandising that is valuable in his new position.

James G. Moravec has been appointed manager of the Moline, Illinois branch office for Penn Electric Switch Co., of Goshen, Indiana to succeed Howard C. Shilling.

Moravec was released from active duty in July, 1947, with the rank of Lieut. Colonel after serving since Jan., 1942. Before being called to military service, Moravec was manager of the Moline branch for approximately 5 years. A graduate engineer, he has had a wide and varied experience in the application and sales of automatic controls for heating, refrigeration, engine, pump and air compressor equipment.

The Moline office of Penn Electric will remain in its present location at 535, 5th Ave. Bldg.

SCHWAB perfects three NEW UNITS

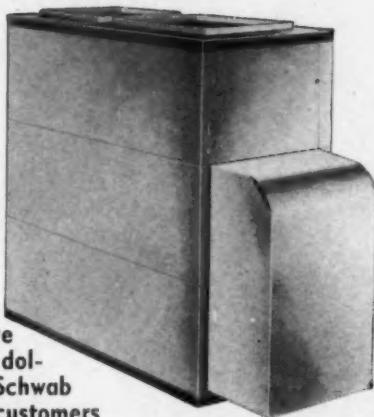
* HOT WATER BOILERS, STEAM BOILERS, AND AN AIR CONDITIONING FURNACE — ALL OIL-FIRED — NOW PUT SCHWAB INTO EVERY PHASE OF AUTOMATIC HEAT FIELD. NOW EVERY PROSPECT CAN BE YOUR CUSTOMER.



New boiler heats water twenty times faster with 30 to 40 percent greater economy. This and other dynamic selling points are the result of typical Schwab creative design and meticulous construction. They put the power punches into your sales story.

Ask about
the boiler
with the
percolating
action!

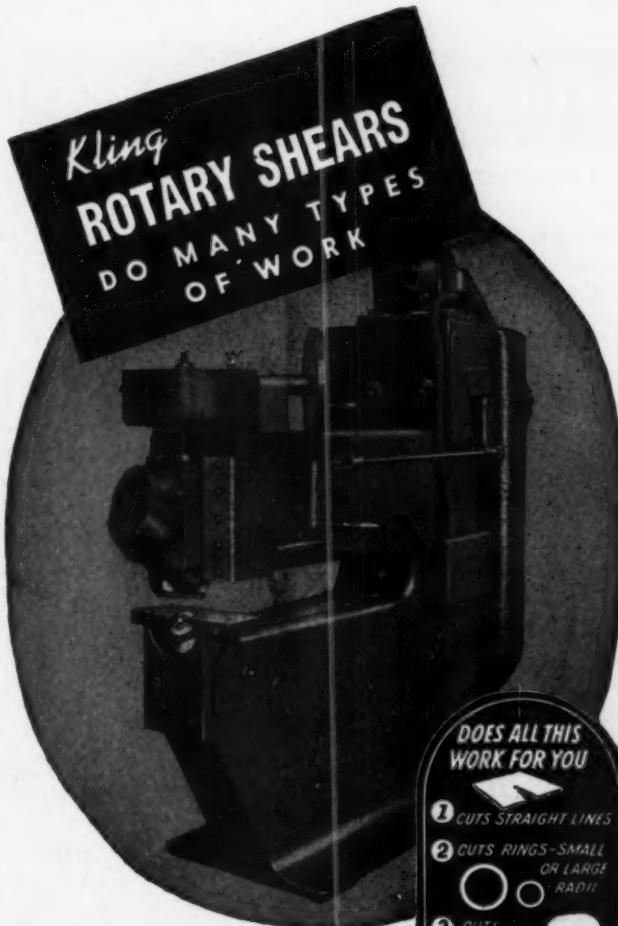
Air conditioning furnace is all-steel welded unit, shipped assembled, but may be partially dismantled, if necessary, for unusual installations.



Schwab dealers have long profited, in pure dollars and cents, by Schwab perfection. If your customers require lasting quality at reasonable prices, you should investigate the Schwab franchise. 82 years of manufacturing experience, plus complete production facilities under one roof, guarantee fast delivery and unqualified service.

Write, wire or phone—

The **SCHWAB** SAFE COMPANY
LAFAYETTE INDIANA



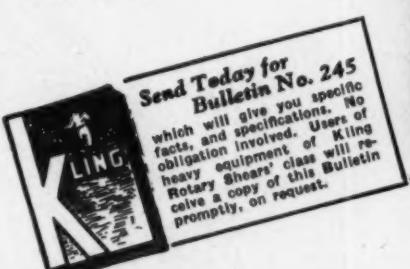
Yes, and With Hairline Precision

Rapid operation . . . Hairline Accuracy . . . the use of Kling Rotary Shears marks the latest development in cutting mild steel, and sheet metal, up to 1-inch with amazing savings in time, labor, and production costs.

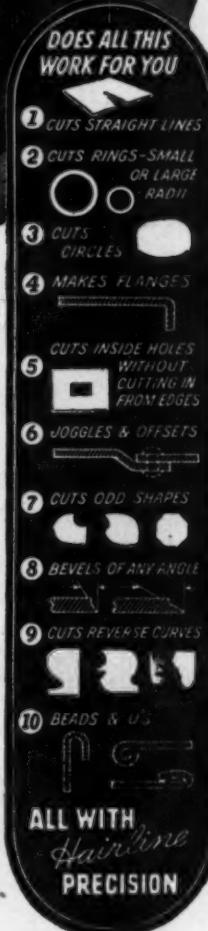
For exacting projects (see illustration at the right), no single unit of metal-working equipment does so many different things so clearly and efficiently as does the Kling Rotary, pictured above.

In metal working plants, automotive, aviation, home appliance, and other industries, where work of this character is being done, — this machine is held in high regard for its versatility and economy of operation.

This great usefulness is the result of half-a-hundred years of engineering experience which prospective buyers, with reason and repeat, applaud.



which will give you specific facts, and specifications. No obligation involved. Users of heavy equipment of Kling Rotary Shears' class will receive a copy of this Bulletin promptly, on request.



ALL WITH
Hairline
PRECISION

KLING BROS. Engineering Works

1325-AA No. Kostner Ave., Chicago 51, Illinois
EXPORT DEPT. 1111 South Ferry Building, New York 4, N. Y.

WITH THE MANUFACTURERS

Wheeling Corrugating Company, Wheeling, W. Va., has announced the completion of a new warehouse at Louisville, Ky., at 1424-1436 So. 15th Street. Former address was 1401 Dixie Highway, in a warehouse which was opened July 1, 1935. The new building is of steel and concrete construction, with brick and glass block in the adjoining air conditioned office building. Warehouse floor space in the new quarters is 180x400 feet, or a total of 72,000 square feet, for stocks of Wheeling sheets and fabricated products. The office is 40x100 feet. The building was designed by H. S. Bell, Wheeling factory engineer, and built by the Whittenberg Construction Co., of Louisville, and 25 sub-contractors.

When a manufacturer makes a product for a field such as the heating field, he must look beyond the day of the sale of his product and plan on service for that product in the future. Webster Electric Company, producer of fuel units for oil burners, had a service department at the factory to handle fuel units returned for repairs. In 1935, however, it was decided to expand this service to a point at which it would be available locally, for nearly all dealers, thus enabling them to give better service in emergency repairs.

The Webster Electric Authorized Service Station was the result of this new service technique. To establish



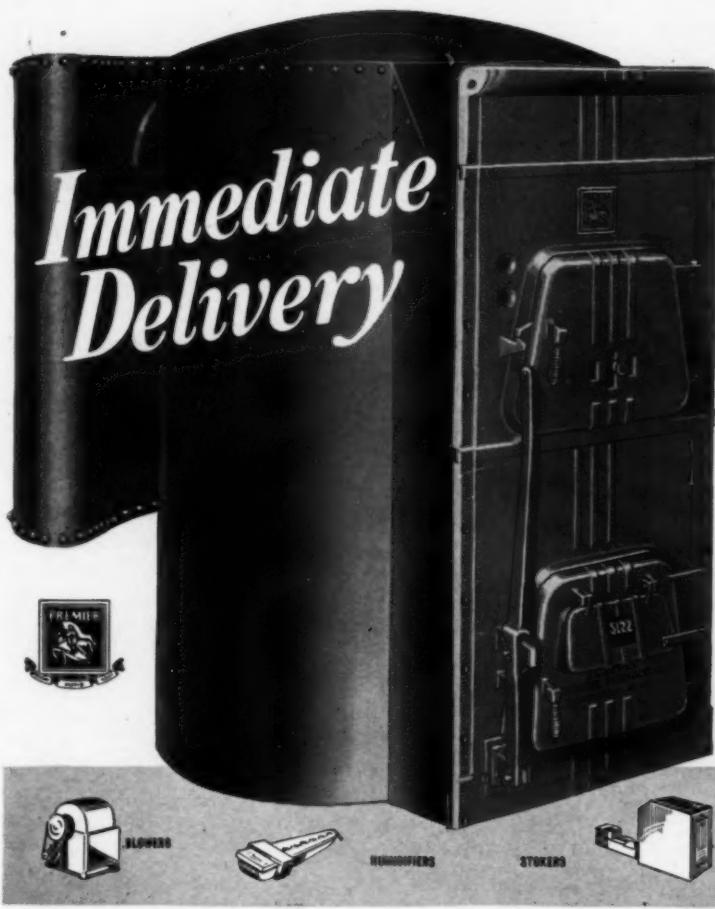
View of shop in authorized service station, Bell Pump Service Co., Hartford, Conn.

such a station, a new organization was set up or one selected that was capable of the technical work and suitably located. The personnel of the organization was supplied with all necessary parts and equipment and trained in the technique of testing and repairing all Webster fuel units. It was then prepared to function as an Authorized Service Station, serving the dealer but not selling any item that would cause him to compete with the dealer since it is actually a service organization.



Sheet metal men everywhere are turning out accurate work quickly and easily with Niagara machines and tools for shearing, blanking and forming sheet metal.

NIAGARA
MACHINE & TOOL WORKS
BUFFALO 11, N. Y.
District Offices:
Detroit, Cleveland, New York



PREMIER "SL" WELDED and RIVETED STEEL FURNACE

Seams Riveted and Welded Double Tight and Permanently Leak-Proof

Roller Bearing Grates — Waist High Shaker Specially Baffled Radiator, supported on Cast Iron Brackets

Double Sealed Connecting Collar — Permanently Leak-Proof

Guaranteed for Ten Years — Grate Included

PREMIER FURNACE COMPANY
DOWAGIAC, MICH.



If it's a job for a pillow block there's a *Randall* that's right

You keep costs down, assure customer satisfaction, too, when you put the *right* pillow block into the job . . . and you'll find the *right* one, not too heavy, not too light, in the complete *Randall* line.

Randalls have proved their dependability in millions of air handling installations. Only *Randalls* have graphite-filled lubricating grooves and oil feed plug machined into a phosphor bronze bearing. You can depend on the built-in graphite, and oil from the big reservoir, to keep every installation running smoothly and silently long after you finish the job. You pay no more for the *right* *Randall*, for prices are competitive.

See which *Randall* Pillow Blocks are *right* for those jobs you have coming up now. Write for catalog 47, with detailed information and valuable installation hints.

**QUIET
ECONOMICAL
SELF-LUBRICATING
SELF-ALIGNING
RUGGED HOUSING
ACCURATELY MACHINED
EASY TO INSTALL**



MODEL 248 . . . a lower-priced pillow block recently added to the *Randall* line.

STREAMLINER. One-Piece Steel Housing . . . for maximum air flow.



Randall Graphite Bearings, Inc.

Department 1111

•

609 West Lake Street

•

Chicago 6, Illinois

GOERGEN-MACKWIRTH Cyclone Separators



for collecting
**DIRT,
DUST,
SHAVINGS**

● If dirt, dust, shavings or other useless or harmful particles are created in your manufacturing process, a Goergen-Mackwirth Cyclone Separator will remove and segregate them efficiently and economically. The complete range of sizes available in Cyclone Separators makes it easy to select the exact size for your requirements. Special types and sizes can be designed for individual needs.

Goergen-Mackwirth Cyclone Separators require less horsepower for the fan operation because their offset outlet and clockwise rotation within the collector body greatly reduce the resistance loss through the collector. Their design eliminates the back-pressure found in ordinary separators.

Ask to have one of our engineers survey your problem and submit recommendations. Or write telling us what you want to do and we will quote on the separator needed to do the job.

Goergen-Mackwirth

COMPANY, INC.

817 Sycamore Street, Buffalo 12, N.Y. Phone: Cleveland 6661
SPECIALISTS IN THE MOVEMENT AND CONTROL OF AIR

KRUCKMAN

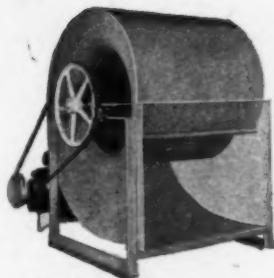
(Continued from page 71)

ance, a planned economy under military direction, as well as a temporarily regimented society. There is no remote question they would abandon the controls after any Emergency that might occur. But any controls arouse apprehension. It is doubtful even if the President would be party to any system involving such controls, especially in an election year. He knows that the people are becoming painfully aware that the Bureaus and Departments never give up any powers they have grabbed. Each of the steps they take—steps in consolidation of authority and power—make the Departments and the Agencies more solid as the parts of the Government which interpret the laws and make the politics behind the laws. The concentration of the power in Washington which already exists has made the functions of the Congress more limited and more difficult. Moreover, the confusion, and the bewilderment out among the people of the grassroots—which includes the business community—make it much more difficult for Congress to get the support of the people in the actions that Congress feels it must take to protect their interests.

It is a tremendous problem. The forces which sincerely, and rightly, believe in concentration of powers of control in the event of the prospect of War, logically hold that the next War will be such an absolute effort at annihilation that it will be necessary to bring every tiny bit of the nation within the organized pattern of offense and defense. They frankly feel it will be unwise to weaken the whole by establishment of such civilian units as we had in the last War, organizations such as the War Production Board, the Office of Price Administration, the Office of Defense Transportation, and similar war bodies which were directed and manned by civilians as civilian institutions. There is honest and utterly sincere conviction that our safety and our chance for victory could be assured only by bringing everything under total control of the National Defense Agency, which now includes the Army, the Navy, and the Air Forces.

ORC—What Is It?

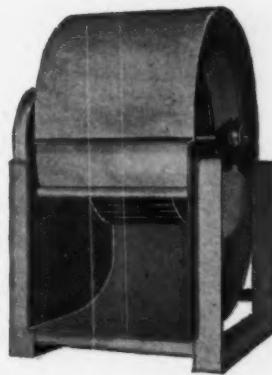
It is emphatically not an alarmist philosophy, or propaganda, in the opinion of a large part of official Washington, to discuss freely, and with candor, the possibility of a closer approach of the probability of War. They feel it may be a fatal disservice to the national economy to refrain from discussing openly what in some quarters is considered "off the record." Business men who come to Washington have learned much from the people in the Department of National Defense, in recent weeks. The most striking development undoubtedly is the organization of the Industry Reserve Corps. It includes the workers in the sheet metal industries. Sometimes it is called the Industry Reserve Corps, other times it is known as the Organized Reserve Corps. In effect it is an auxiliary military organization, created by the National Defense Department, but entirely a volunteer organization, composed of the workers in the various industrial economic units of the national economy. The member of the Reserve is not a regular Army man, nor is he a National Guardsman. He can be called into active duty only by the President, after Congress has declared a State of



AIRBORNE INDUSTRIES, INC.

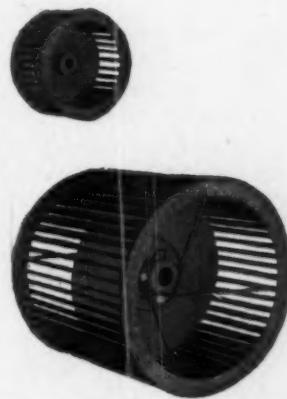
Manufacturers

628 COLFAX AVE., N. MINNEAPOLIS 5, MINN.



ATTENTION! Mfrs. of Air-Conditioning Units - Furnaces - Oil Burners - Industrial Exhaust Systems - Ventilating Equipment - Grain Separators - Can Washers.

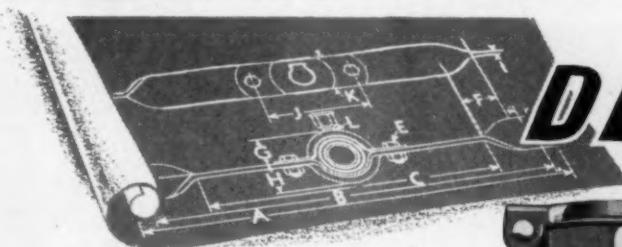
FOR BETTER CONSTRUCTED
Wheels - Blowers - Housings - Exhausters
From Die Stampings



MADE TO YOUR SPECIFICATIONS the way they should be made—by experts who know how. **QUALITY WORKMANSHIP—SOLID CONSTRUCTION—PRICED RIGHT—SERVICE—**Wheels balanced before and after Painting—Can be run at higher tip speeds—**SHIPMENT WITHIN 10 DAYS**—We stand behind our products—Price lists sent on request.

MANUFACTURERS AGENTS WANTED

WE MAKE 'EM - - - BETTER!



DESIGNED for **Air Conditioning**

This shock-absorbing pillow block was designed by air conditioning engineers for fans, blowers and other devices requiring **silent operation, perfect alignment, self-lubrication, and minimum obstruction to air flow**. No other bearing provides all of these advantages.



Shown here is one of several types of mountings. We are glad to cooperate with engineers in designing mountings to meet their specific needs. Tell us your problems and we will send other types of mountings, specifications and complete information.

TRIANGLE MANUFACTURING CO.

392 Division St.

Oshkosh, Wis.

gency. Probably it would mean in effect, if not appear-Emergency.

Under present plans, each unit of the Reserve stems from the sponsorship of some specific business organization. Each military unit is maintained on an inactive status with cadre or key personnel supplied from the ranks of officials and employees of the sponsoring organization. There are three classes—A, B, and C. Class A will consist of units with full complements of officers and enlisted men. In an emergency they will be ready for assigned missions after a short additional training. Class B units will have full complement of officers and a cadre of key enlisted men, which on mobilization will be brought to full strength through the selective service system. Class C units, comprising the balance of technical or specialized type units will consist of a full complement of officers only. Each group will get training of one drill period a month. It also is intended they shall have two weeks summer field training. Those who wish to enlist must voluntarily apply in writing. The Commanding Officer of a unit is chosen from among the eligible reserve officers by agreement between the sponsoring business house or plant or organization and the National Defense Department. At present only those who were in the Service are eligible to volunteer. They are given the same rank as they held when they were honorably discharged from the Army. They can attain higher rank by special work and additional training. Units consist of 13 to 15 men. Business people who wish to sponsor an Organized Reserve Corps unit or units in their plants or shops are invited by the Government to apply for further information.

in the First Army Area, Lt.-Col. John A. Joyce, Quartermaster Section, Headquarters First Army, Governors Island, New York 4, N. Y. Second Army Area, Lt.-Col. Harry Troxell, Quartermaster Section for Affiliated Units, Second Army Headquarters, Fort Meade, Maryland. Third Army Area, Major Carroll L. Musser, Quartermaster Section, Third Army Headquarters, Atlanta 3, Ga. Fourth Army Area, Lt.-Col. Benjamin E. Edwards, Jr., ORC Section, G-3, Fourth Army Headquarters, Fort Sam Houston, Texas. Fifth Army Area, Lt.-Col. Ralph L. Guzelman, Quartermaster Section, Fifth Army Headquarters, Room 309, 1660 North Hyde Park Boulevard, Chicago 15, Ill. Sixth Army Area, Lt.-Col. S. Gordon Hyde, Sixth Army Headquarters, Presidio of San Francisco, California.

A special division is to be organized for Smaller Business. A bill has been written which provides for this organization, commanded by a Major General, and a General Staff, modeled after the General Staff of the Army.

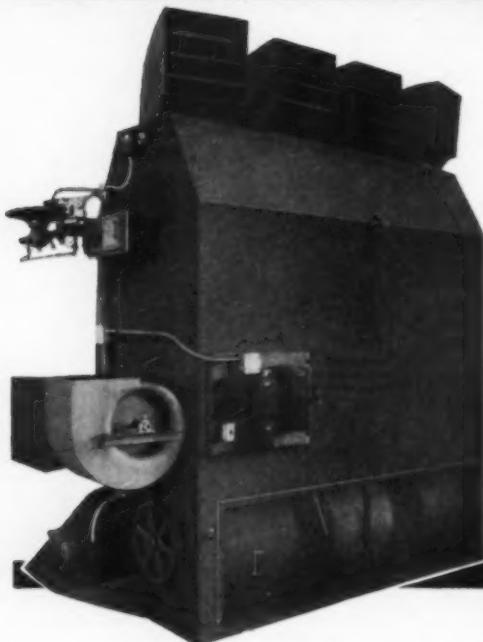
Markstein—

(Continued from page 73)

dies made and for an additional step in the printing process. If an advertising budget of sufficient size is available, they can be strung out indefinitely, much in the manner of letter inclosures. For the smaller contractor whose budget is limited and who must therefore depend upon mimeographing or cheap multigraphing for his letter production, there is the cartoon letter.

This does not lend itself readily to mimeographing. Multilithing, however, is only a little more expensive

AIRTERM DIRECT-FIRED WARM AIR HEATERS



**Offer You These Six
Heating Advantages**

- 1 A complete factory heating unit.
- 2 Comes to you ready to set in place.
- 3 Control system wired at factory.
- 4 Available in floor-mounted or suspended models.
- 5 Oil burners or gas burners are interchangeable to meet future fuel conditions.
- 6 Capacities from 650,000 to 1,950,000 BTU per hour.

For detailed information, write for Bulletin 801-A.

AIRTERM
MANUFACTURING CO.

706 South Spring Ave. • St. Louis, Mo.

55

AMERICAN ARTISAN, November, 1947

why snip sheet metal
by hand . . .

when ELECTRIC
SKIL* Shear cuts
10 times easier!

• It doesn't make sense to cut metal by hand when you can save time, effort and dollars with a SKIL Shear on the job. SKIL Shear cuts fast, clean, through a variety of sheet metals . . . hot rolled steel up to 16 ga., and other metals in proportion. It's compactly built, no bothersome handle, cuts to within a radius of 1 inch, and special deflector plate (patent applied for) reduces curling when trimming. Ask your Distributor about a demonstration today.

SKILSAW, INC.

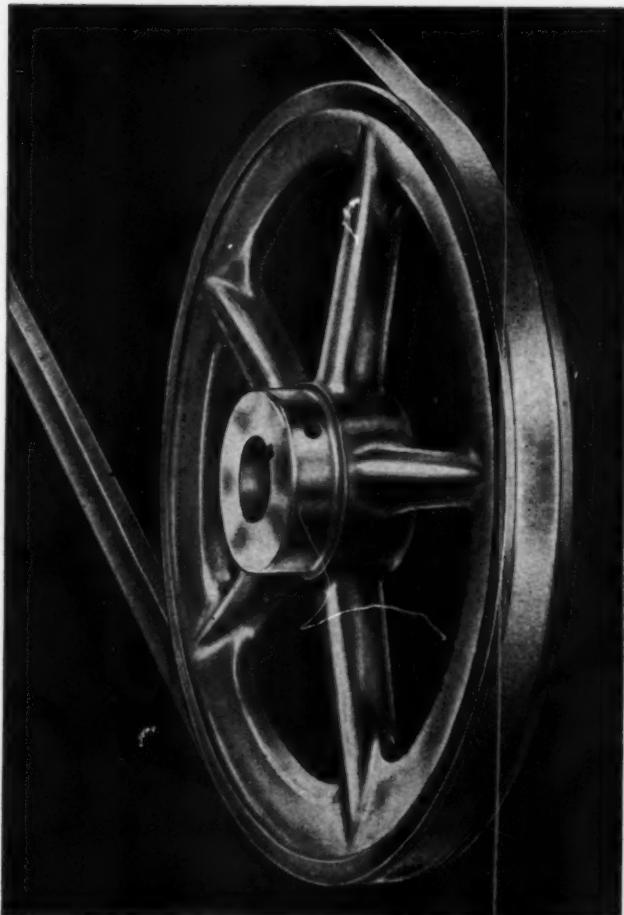
5033 Elston Ave., Chicago 30, Ill.

Factory Branches in Principal Cities

In Canada: SKILTOOLS, LTD., 66 Portland St., Toronto, Ont.

*SKIL Shear is made only by SKILSAW, INC.

ELECTRIC PNEUMATIC
SKILTOOLS



MAUREY V-PULLEYS

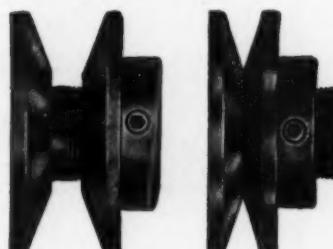
provide a L-O-N-G step toward
TROUBLE FREE Performance

Our long experience in designing and manufacturing V-Pulleys, our complete understanding of their uses, and the finest materials—all are combined in making Maurey V-Pulleys the very best Pulley installations for Refrigeration and Air Conditioning systems as well as for Fans and Blowers.

For unfailing, continuous operation be sure to specify Maurey V-Pulleys.

**Maurey
Manufacturing Corp.**

2915 South Wabash Avenue
CHICAGO 16, ILLINOIS



Northwestern means business!

.... and we can prove it, too! We've always done our utmost to provide dealers with the ultimate in fast, reliable service and the fact that we've succeeded seems to be borne out by the large volume of repeat business we enjoy from year to year. Dealers *know* they can depend on Northwestern . . . they *know* it reflects in savings in time and money to their customers . . . they *know* that subsequent customer recommendation goes a long way toward turning up new prospects and business for them.

There's plenty of business to be had, too, but it means getting out NOW and lining it up before the real cold weather sets in. *You* get the orders and depend on *us* to fill them.

If *YOU* haven't done business with us before, a trial order will convince you that Northwestern service saves time, trouble and money. Your inquiry will be promptly answered.

*... we have a new
catalog, too!*

It's a big one—85 pages—listing the thousands of patterns available, and you can use it in combination with our price list to estimate the cost of the many parts listed. It's yours for the asking . . . just write for it today.

NORTHWESTERN STOVE REPAIR COMPANY

662 West Roosevelt Road

Chicago, Illinois

than a mimeo job and the addition of art-work does not run up the bill.

In fact, "stock" cartoons can be purchased. There are several houses that sell these. Using them, the contractor saves the creative and highly specialized job of dreamnig up cartoon ideas, and he saves the expense of having a local artist put down his cartoon creation on paper. (A partial list of cartoon houses from whom finished drawings may be secured at a very low cost includes Stivers Studio, 111 New Montgomery St., San Francisco; Cobb Shinn, 721 Union St., Indianapolis, Ind.; and Knott Cartoon Service, 29 Main street, Evansville, Ind.)

Make the Copy Sell

A third way to make your sales letters different is to write the copy in an unusual way. This is also the cheapest, since mimeographing can take care of the job. One southern company developed a highly effective scheme for doing this. Each of its monthly letters—sent regularly to a selected list—was built around a dictionary definition of a long word.

The dictionary is full of long words that practically none of your readers ever heard. Each of these can usually be tied around a promotion. Here are a few ways in which words, taken at random from Webster, can be made selling tools to increase your volume figures and make your letters better read:

Calyptra. This is the hood or cover that protects parts of certain plants, notably moss. Draw a comparison between being "hooded" and having your health protected by pure, clean air.

We Manufacture ONLY DRAFT CONTROLS



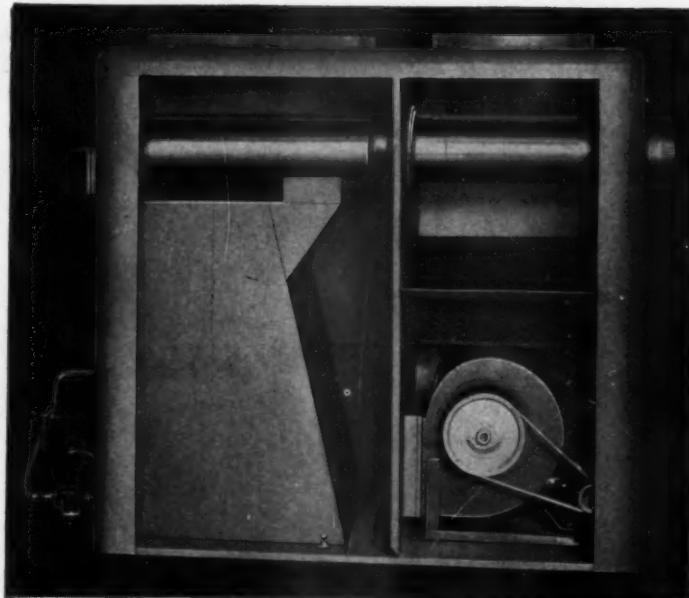
Our business is *solely* the production of better Draft Controls—nothing else. ALL of our engineering ability and every facility in our modern plant is devoted exclusively to building Barometric Draft Controls at reasonable prices—controls that can't be beat at any price.

We have been manufacturing draft controls for years—for every type and size of heating and power installation. We believe we have the solution to any draft control problem you may have.

Write Today for Complete Information

Cole-Sewell Engineering Co.
2288 University Ave. St. Paul 4, Minn.

Presenting the "SILENT"



275-gallon, 14-gauge fuel oil tanks
available with units.

MANUFACTURED BY **JACOB BRENNER CO.**
FOND DU LAC WISCONSIN

STEEL-WELD
Oil Burning

WINTER AIR CONDITIONER

A modern automatic heating plant for your most discriminating clients. Features keen beauty and smooth performance skilfully engineered to provide maximum comfort. The "Silent" is a real money-maker for aggressive dealers.

Please write for literature.

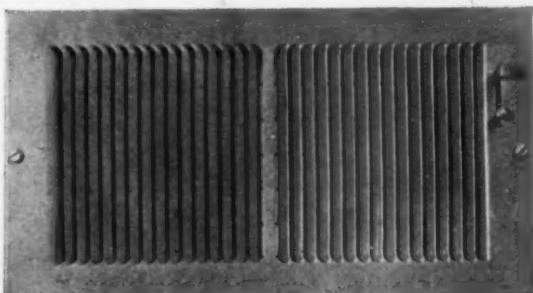
A-J Registers and Grilles

Enable You to Compete
at a Profit

With competition getting keener, you must have a COMPLETE line of registers, grilles and diffusers at down-to-earth prices for the quality and performance your market demands.

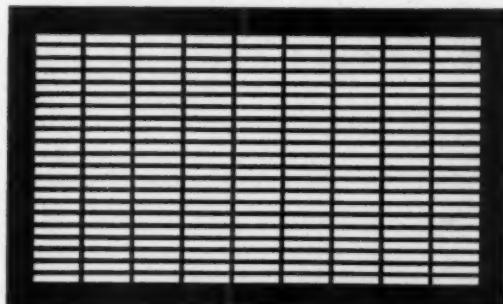
The A-J line offers what you want on all counts. It's complete, it's competitive, and every item has the strength, design and functional features that mean extra value. A-J makes it easy for you to sell and satisfy.

For the very finest in air outlets of all types to perform under the most exacting conditions and harmonize with any architectural styling, write for full details today. A postcard will do. Let us send you a catalog NOW.

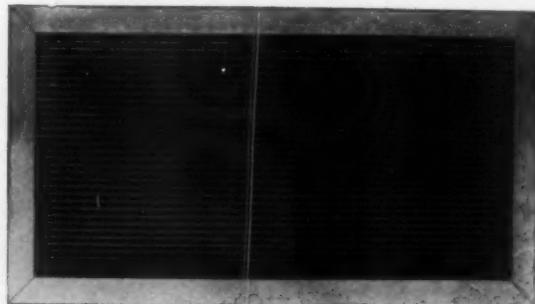


Directional flow registers, either single or multileaf, of a design that provides greatly increased control of air dispersion.

Door grilles,
also adaptable
for wall in-
stallation, for flush
or channel
mounting, with
V bars to
prevent see-
through.



Stamped grilles for every purpose in a wide variety of designs, from No. 10 to No. 16 standard gauge. Style pictured, 75% free area for little ventilation.

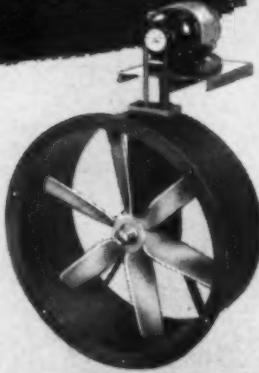


A-J MANUFACTURING COMPANY

2119 Washington St.

Kansas City 8, Mo.

LEMCO SPRAY BOOTH FAN



AVAILABLE FOR IMMEDIATE DELIVERY ... WITH EXPLOSION-PROOF MOTORS

Cure your spray booth problems with this LEMCO unit engineered and designed for all applications requiring the positive elimination of hazardous fumes and vapors. Enclosed ball bearings, 6 wing perfectly balanced blades, adjustable motor mount, heavy steel construction, maximum air delivery and quietness of operation are some of the features making this LEMCO fan ideal and practical.

Available in 18" and 24" sizes.

Write today for information and catalogue of complete line of ventilating equipment and parts.

LAKWOOD ENGINEERING & MFG. CO., INC.

1748-1756 W. LAKE STREET CHICAGO 12, ILLINOIS



IF YOU'RE IN A FOG
ABOUT DUSTBAGS...
Let's talk it over!

Most dust recovery bags take a terrible beating and replacement is quite an item.

If you will tell us your dust bag problems, we are sure that we can help you. The WAGNER line meets most industrial dust bag requirements. If yours is a peculiar problem, we'll be glad to talk about designing a special bag to meet your exact specifications.

For more than two generations, WAGNER canvas products have been standard equipment in many industries. Let's talk about your dust recovery bag or other canvas needs.

The WAGNER AWNING & Mfg. Co.
2658 SCRANTON ROAD • CLEVELAND 1, OHIO

Caliginous. This word means dim, obscure, dark. A comparison can be drawn between being in the dark and being in the light—as tied to having or not having *Indoor Comfort* in the home.

These are two tongue-twisters taken at random. The dictionary contains thousands of others. Almost any one can be used with a little ingenuity.

By tying them in—or by using one or another of the effective means for making your sales letters different, the results from a powerful advertising can be made even better.

Different letters pull.

Konzo—

Comfort Dividends

(Continued from page 89)

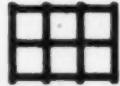
thermostats have adjustments which enable the heating contractor to set the temperature differential to close limits. If a careful reading of the manufacturer's instruction sheet will enable you to proceed with this adjustment, set the differential to a value of about $\frac{3}{4}$ deg for gas-fired and hand-fired units and about 1 deg for oil-fired and stoker fired units. If you are unable to figure out the directions, it would be advisable not to attempt this adjustment without contacting the manufacturer or a representative.

The objective sought in this last adjustment is to make the burner operate frequently and for short periods. Minimum cycling periods are about:

a) 2 minutes for gas burners.

PERFORATED METALS

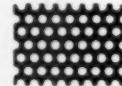
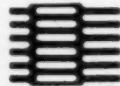
ARE
ESSENTIAL



They are used in the processing of grain, food, chemicals, ore, coal, rubber, petroleum and many other products.

Our range of sizes is great and we aim to meet the most exacting demands.

Write us for information.

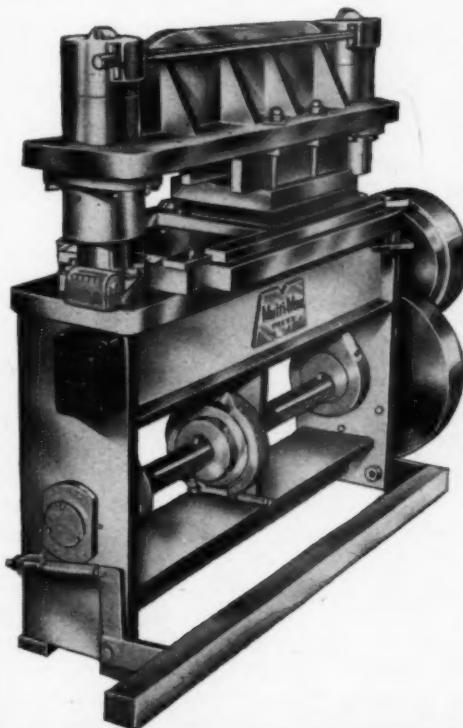


The Harrington & King Co.
PERFORATING

5649 Fillmore St., Chicago 44, Ill.

114 Liberty St., New York 6, N. Y.

MOVE A **MULTI-MAX** PRESS RIGHT INTO THE PRODUCTION LINE and Eliminate Your Materials Handling Problem . . .



The New Multi-Max is a 30-ton mechanical press designed for production line operation with one operator, and can be used. It requires no foundation, has no overhanging parts and because of its small, compact size (36" x 75") it may be moved in and out of the shop being made. Delivery is picked up and moved in and out of the shop being made. Write or wire for production line as needed. Unlike any complete description and prices.

other press in existence, the Multi-Max has a "Plug-in" advantage: it may be taken to

the work rather than depending upon the work being brought to it. Finished parts may be fabricated right at the point of assembly in required amounts, thus saving long runs, large inventories, handling and stacking costs, and releases valuable storage space for more productive use. The Multi-Max features a large bed area in a small machine that permits it to be used as a shear, press, brake and forming machine. It will

SPECIFICATIONS:

Capacity	30 tons
Stroke	.2"
Ram Adjustment	.2"
Shut Height (Stroke down, adj. up)	10"
Strokes per minute	100
Bed-Die Space	12" x 36"
Ram-Die Space	10" x 36"
Bed Opening	5" x 32"
Main Shaft Bearings (Heavy Duty Bronze)	3
Back Shaft Bearings (Fafnir, Straddle Mounted)	2
Guide Bearings (Sealed)	.4" diam. x 5" long
Motor Furnished	1 1/2 HP, 3 phase
Height of Bed from Floor	32"
Overall Height	57"
Floor Space Required	36" x 75"
Shipping Weight (Approx.)	3250 lbs.

PARKER MANUFACTURING COMPANY

Manufacturers of Parker 10 and 14 ga. Power Squaring Shears.

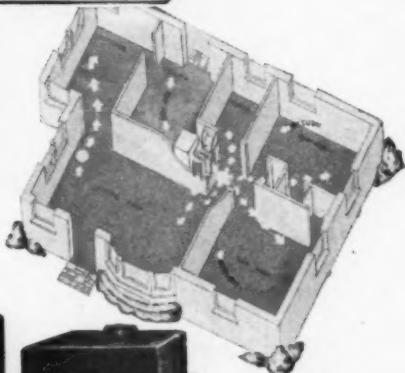
2200 Colorado Avenue

Santa Monica, Calif.

KEHM FREE AIRE

CENTRAL HEATING SYSTEM

Kehm Free-Aire Units occupy little floor space. Use of hallway and doors for circulation of air eliminates need for overhead duct work.



Coal and oil units now available. Coal unit is convertible to oil and gas—a desirable feature for the builder and home owner.

THE PERFECT LOW COST HEATING SYSTEM FOR SMALL HOMES

KEHM FREE-AIRE is the simplest, most effective low cost heating system ever developed for small homes. Used with the single, double or triple opening duct boot (write for Kehm designs), duct work is practically eliminated, and the cost of effective small home heating slashed to an all-time low.

Free-Aire Systems have been tested and proved to the satisfaction of hundreds of builders and architects and thousands of home owners over a period of eight years. Each Free-Aire System designed to our specifications is guaranteed to make all rooms comfortable on the coldest days.

Kehm Free-Aire, in FHA approved designs, can also be applied to basement one and two story homes.

ALL PURPOSE FURNACE Heating Contractors! Here is the heater that can be installed as a stove for spot heating, as a pipeless furnace or with conventional gravity duct work. Also can be used for small furnace replacements. Write for our many design applications and prices.

THE KEHM CORPORATION

135 S. LaSalle Street

CHICAGO 3, ILLINOIS

"More Than a Half Century in Heating"

Licensed under patent No. 2,278,843.



THE VAPOR-OIL FURNACE—5 models ranging from 80,000-174,000 BTU CONSTRUCTED AND DESIGNED to give heat economically for years with minimum of repair and service. EASILY CONVERTED from oil to gas—or—in case of fuel emergency—the burner can be removed in 10 minutes by the home owner and wood or coal be burned as in a fireplace.

Immediate Delivery

AUTOMATIC FURNACE COMPANY
1111 Race Street Lansing 5, Michigan

VAPOR-OIL
CLEAN - AUTOMATIC - ECONOMICAL

AIR-FLO
AUTOMATIC SHUTTER
WEATHER-SEALED

*leads the
field in
features!*

There is every reason why you should use AIR-FLO shutters on your jobs. New heavy reinforcement strip adds strength and long life to the louvers, assures quiet operation and perfect counterbalance, prevents rattling. Aluminum louvers open fully, permitting capacity fan operation. Deep shroud protects shutter from high winds. Tie-rod, brackets and bearings inside frame, not exposed to weather. Special finish resists corrosion. Many other features. Write for illustrated catalog 42-C of the complete AIR-FLO line.

AIR CONDITIONING PRODUCTS CO.
2340 W. LAFAYETTE BLVD. DETROIT 16, MICH.



FRONT VIEW--CLOSED

MODEL
A-555

- b) 3 to 4 minutes for oil burners and stokers.
- c) 2 minutes for dampers on hand-fired equipment.

Summary of Tuning Operations

Any automobile owner who takes his car into a garage for a "tuning" job expects certain basic services such as cleaning of spark plugs, adjustment of timer mechanism, etc. Any home owner who buys a winter air conditioning unit also expects to obtain a heating plant, properly "tuned" to meet the requirements of his home. All too often he purchases only an assembly of registers, ducts, controls, blowers, burner and furnace. Home owners who seek our advice regarding recommended makes of furnaces or burners are first advised to investigate the responsibility and skill of the heating contractor. The contractor who practices after-installation "tune-up" service and who makes known the fact should never suffer from lack of business.

Even a modest gasoline filling station has equipment worth several thousands of dollars to enable the service man to measure and check such items as ignition and timing, batteries, wheel alignment, etc. *Is it unreasonable to expect a heating contractor, who has an even greater investment in his shop, to have a few basic instruments that will enable him to measure and check temperatures, air velocities, and burner cycles?*

The contractor may run into some installations in which, after the five steps enumerated have been gone through, one room may fail to come up to the desired temperature. Experience has indicated that if the duct design has been made in accordance with the

**SHEET METAL
MACHINERY**



MODEL "S" (PORTABLE)
Forms Pittsburgh Locks, Acme Locks and
Drive Cleats

SEE US FOR

Pittsburgh Lock Machines, Roll Forming Machines, Roller Dies, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery.—Your inquiries invited.

MAPLEWOOD MACHINERY CO.

2634 FULLERTON AVE.

CHICAGO, ILL.

Portals to Progress



...in AIR CONDITIONING— HEATING—VENTILATING

Come To Grand Central
Palace . . . New York City
February 2 To 6!

Assembled here you'll see over 350 arresting displays and demonstrations of the newest and best ways to heat, ventilate and condition air for all types of commercial and public buildings, industrial plants, and homes. Here in less than a week's time you can study and compare the relative merits of everything from complete units to maintenance supplies—in the light of your customers' needs . . . discuss your problems and plans with technical attendants at the booths—men on hand expressly to help you with your problems, tell you what you want to know to keep abreast of the trends and practices in these active fields.

The wealth of worthwhile stimulating ideas, information and contacts at this exposition will be invaluable in building new business for you. Plan now to attend—have your associates come, too. Mark the date.

Under Auspices of
American Society of
Heating & Ventilating Engineers

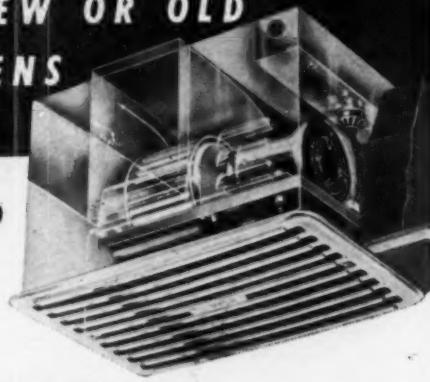


8th Air Conditioning Exposition

Management International Exposition Co.

THE BEST VENTILATION
FOR NEW OR OLD
KITCHENS

TRADEWIND
CLIPPER
BLOWER



The Clipper is easily vented through a side wall in a 2-story installation.

THIS proven method of ventilating home kitchens and other small rooms traps heat, grease and odors the instant they rise and expels them out-of-doors. Clipper Blowers offer two vital advantages:

1. They are located in the ceiling directly above the stove—where the heat and smudge first collect.
2. The motor in the Clipper is completely separated from both the blower and the dirty air—an exclusive patented feature which has resulted in greater efficiency, longer life, easier servicing.

Study the sketches above. Clipper Blowers are quickly and inexpensively installed in the ceiling between joists and vented outside. Only an inconspicuous "dripless" ceiling grille is visible, yet motor and blower assembly are instantly removed without tools.

Ask your jobber for details of the Clipper Sales Plan or write us for complete information.



TRADE-WIND MOTORFANS, INC.
5703 SO. MAIN ST., LOS ANGELES 37, CALIF.

WHITNEY LEVER PUNCHES



NUMBER
FOUR "B"
PUNCH

This punch for sheet metal work has a capacity of $\frac{3}{4}$ " through 16 gauge. Weight 3 lb. Length $8\frac{1}{2}$ ". Depth of throat 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key. A time-saver for your up-to-date shop.

And here's another handy tool for the modern shop — the No. 2 Punch. Length 28". Capacity $5/16$ " through $\frac{3}{4}$ " iron, weight 14 lbs., depth of throat $1\frac{11}{16}$ ". Punches and dies $8/32$ " to $\frac{3}{8}$ " by $1/64$ ".



NUMBER TWO
PUNCH

W.A.
WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

EFFECTO-GRILLE



No. 120A

Series No. 100

GRAVITY REGISTER

with Removable Face for Gravity or Air-Conditioning Installations

Series 100 registers, with removable face, have modern streamlined styling, large free area and minimum resistance. To assure maximum free area, the horizontal fins are set at the factory. The fins are flexible and may be readily adjusted up or down to any desired angle. Available in all sizes required for all new or old gravity installations or as a replacement register when changing an existing gravity system to air conditioning.

We also carry a complete line of Air-conditioning Registers and Grilles

TURNBULL

MANUFACTURING
AND DISTRIBUTING CO.

9930 FREELAND AVE.

DETROIT 27, MICH.

method given in Manual No. 7 of the National Warm Air Heating and Air Conditioning Association, no difficulties of this nature will be encountered. If any one branch run fails to deliver the expected quantity of air when the blower is operating continuously the fault is probably in the resistance imposed to air flow by sharp elbows, poor fittings, or undersized ducts. The temptation will exist to tamper with the blower switch and speed up the blower. *Don't do it!* Look to your sheet metal practice and your design procedure and correct the basic fault in the air distribution system.

The argument is frequently raised that practically continuous blower operation will increase electric costs and be noisy. Continuous blower operation at relatively low speeds, as recommended in this procedure, will not require as much electrical power as high-speed operation of a blower operated only half as long. Frequent starts and stops of the high-speed blower not only require greater starting currents, but are audibly more distracting than a continuously operating blower.

It is apparent from the teaching program of the Association that the location and type of registers should be carefully studied for each installation. Two-way adjustable registers, or their equivalent, are practically mandatory items in current practice.

One other question frequently voiced refers to two-speed and to variable speed blowers. Test data on two-speed blowers have been reported and the results have been highly satisfactory. The preceding discussion attempts to show how heating contractors can get equivalent results with a single-speed blower. Test



Speed Up Orders With a BEVERLY SHEAR

Throatless shears that cut any shape . . . straight, circular or irregular. **FASTER**—accuracy! Order No. 1 for 14 gauge. No. 2 for 10 gauge. No. 3 for $3/16$ inch mild steel and 10 gauge stainless.

BEVERLY SHEAR MFG. CO.

3001 W. 110th Place

Chicago 43, Ill.



MONMOUTH HUMIDIFIERS

● This accessory is really an outstanding PROFIT ITEM for any dealer! You do not have to carry a large stock—with three sizes selected from the entire Monmouth line, you cover about 80% of all installation requirements. Get our price on this 3-package kit, with your recommended sales price, and then figure up the nice profit you have every time you put in a Monmouth. Installing a humidifier alone is a profitable job, and when added to furnace repair, reset or replacement work, it is doubly worth while.

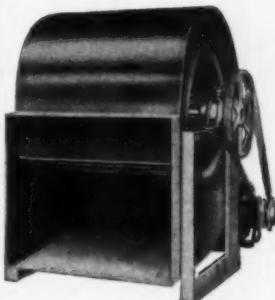
Every warm air system, new or old, needs healthful, automatic humidification. For dependable service and trouble-free efficiency, Monmouth leads them all—correctly engineered, conscientiously built—no headaches afterwards. We also make Monmouth Humidity Conditioners for all radiator jobs. Details and prices on request.

THE CLEVELAND HUMIDIFIER CO.
7802 Wade Park Ave., Cleveland 3, Ohio

Properaire BLOWERS

EXHAUSTERS and FANS

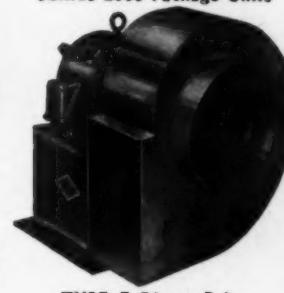
Easily adapted, high quality air moving equipment at attractive reasonable cost.



"B" ASSEMBLY Belt Drive



SERIES 2000 Package Units



TYPE E Direct Drive

Built for the HOME and OFFICE and for STORES, FACTORIES and INSTITUTIONS.

Ask Your Jobber or Write for Complete Descriptive Information.

GRAND RAPIDS DIE & TOOL CO.
1519 Madison Ave., S. E. Grand Rapids 7, Mich.

REPAIR PARTS

for...STOVES•FURNACES•BOILERS

also

FITTINGS•REGISTERS•SUNDRIES

and...

FIVE GREAT LINES
OF HEATING EQUIPMENT

★ ARMSTRONG! ★ MODERNAIRE!
★ LUXAIRE! ★ RYBOLT!
★ JACKSON and CHURCH

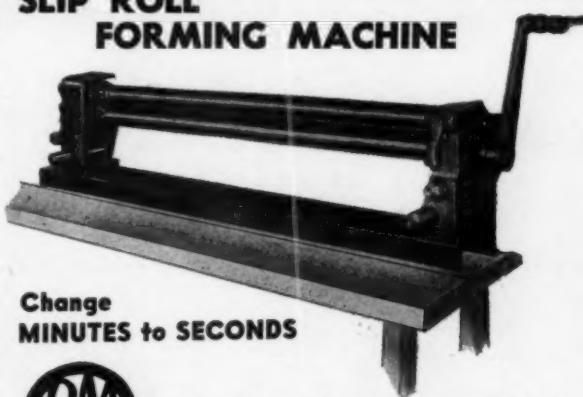
YOUR COMPLETE HEATING NEEDS CAN BE
FILLED BY BUYING AT—

DES MOINES
STOVE REPAIR COMPANY

SAM C. GREEN
FRED R. GREEN

DES MOINES, IOWA
SINCE 1869

RIVERSIDE SLIP ROLL FORMING MACHINE



Change
MINUTES to SECONDS



Jobs that used to use up several minutes can now be done in a few seconds with a Riverside Slip Roll Forming Machine. All adjustments for gauge of metal and curvature of the sheet are made from the front. There is no need to reach around in back to adjust rolls. Another feature of this machine is the new radial adjustment which minimizes flattened area of rolled sheets regardless of curvature. Furnished in both 37" and 31" roll lengths.

Riverside Machinery Co.
Shakopee, Minnesota

CLEAN EVERY TYPE
of FURNACE



with a

GRAND RAPIDS *de luxe* FURNACE CLEANER



DOYLE VACUUM CLEANER CO.

227 Stevens St., S.W.

Grand Rapids 7, Michigan

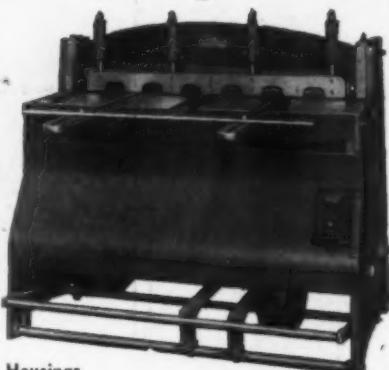
WHITNEY-JENSEN PRODUCTS
30 YEARS EXPERIENCE

POWER
SQUARE
SHEARS

Sizes 36", 42", 60"
Capacity 16, 14, 12 ga.

FAST
DEPENDABLE

Motor Enclosed Between Housings



No. 38
THROATLESS BENCH SHEAR

Capacity—3/16"
Blade Length—5"
Weight—41 lbs.



Write for New Catalog 17-45

WHITNEY METAL TOOL COMPANY

91 FORBES ST. • ROCKFORD, ILL.

data on variable-speed blowers are not too plentiful. Those which we have inspected convince us that the end result of variable-speed blowers is continuous blower operation. It is probable that variable-speed blowers can do a more refined job of regulating the air volume with the load demand, and will provide continuous operation over a much wider range of outdoor temperatures.

It is the belief of industry engineers that much work remains to be done by the heating contractors in correcting existing installations. The job is exclusively his, and time is running short.

Zideck—

Tools and Their Uses

(Continued from page 102)

plates. In the lower plate (b) is securely fastened the shaft (c), usually one at each end of the plates, but often there are four if the size of the dies is larger. The plate (a) is provided with holes through which the shafts (c) protrude, allowing for movement of the plate (a) up and down over them. $\frac{3}{8}$ or $\frac{1}{2}$ inch thick rubber washers (tubes) are inserted over the shafts (c) in-between the two plates (a) and (b). The die-plates (d) and (e) are bolted in position upon the plates (a) and (b), respectively. The alignment of the die-plate is made easier in this construction in that the female die (e) may be bolted tight without regard to the plate (d). Then the die (d) is inserted into the opening in (e) and holes previously drilled in the

LINE UP NOW WITH
ECON-O-COL STOKERS



... to cash-in on the huge backlog of
stoker sales! You increase your
profits through faster sales, make fewer
service calls by selling ECON-O-COL's
complete line of precision-built, highest
quality stokers. And a hard-hitting pro-
motional program backs you up every step
of the way! Details of our exclusive dealer
franchise, now available in several areas,
await your inquiry. Write or wire us today.



ECON-O-COL

The "Stronghearted" Stoker

BUILT BY COTTA TRANSMISSION
COMPANY • ROCKFORD, ILLINOIS

EASY EXTRA PROFITS on every Automatic-Heat installation

Lowest Cost
HOME INCINERATION
available!

Low cost and "self-burning" action bring quick sales for this easy-to-install incinerator—especially where automatic heating prevents rubbish-burning in the furnace! Burns wet or dry garbage and rubbish; advanced down-draft action dries the waste constantly. Contents need be ignited only once or twice a week; ashes removed only once or twice per month. Unit is only 2 feet in diameter, less than 3 feet high! Uses any 8-inch flue; will not affect heating-plant efficiency if tapped to furnace flue. Handsome silver-and-blue duotone finish! Write for details!

The Majestic Co.
842 Erie Street
HUNTINGTON, INDIANA

Majestic
No. 30 FUELLESS
HOME
INCINERATOR



Nationally Advertised Home Necessities for Over 40 Years.

Production is Rolling..



On GERETT "E-Z-ON" Damper Regulators

• WIDESPREAD demand from furnace and heating contractors for the famous, time-saving "E-Z-ON" Damper Regulator has kept us "humping" here at Gerett to supply as many as possible, with reasonable promptness. If your supply house is temporarily out of "E-Z-ONS", try again soon. Our deliveries are improving daily, and, if your jobber does not have them today, try again tomorrow.

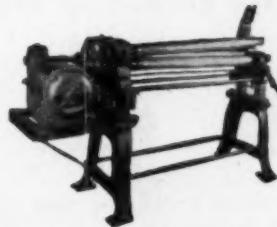
M. A. GERETT CORP.

Metal Specialties Manufacturers

724 West Winnebago Street, Milwaukee 5, Wisconsin

MILTON SLIPROLL FORMING MACHINE

HAND and MOTOR DRIVEN



New
and
Used
SHEET
METAL
MACHINERY

STOCK DELIVERY
1" - 2" - 3" - 4" - 4½" & 6" DIA. ROLLS
Length—16" to 122"

LATEST ADDITION—6" DIA. ROLLS
50" & 62" 74" 98" 122"
¼" Cap. 3/16" Cap. 10 Ga. Cap. 12 Ga. Cap.

Representatives Wanted
MILTON EQUIPMENT CO.
PHILADELPHIA 6, PA.
402-08 RACE ST.
Phone WA-2-1734-1735



THE BARNES BETTER BILT GAS FLOOR FURNACE

The BARNES BETTER BILT GAS FLOOR FURNACE is enthusiastically endorsed by many home owners and builders because of the simple, quick method of installation. It's merely a matter of cutting a hole in the floor and wall furnace-size—then presto! it goes in easily and with a minimum of muss or fuss. And there are other important, money saving reasons why the BARNES BETTER BILT GAS FLOOR FURNACE appeals to so many builders. There's the heavy 16 gauge heating element—the slotted Port Bunsen type burner—the 26 inch overall depth which requires no pit, no basement—the new, neatly designed non-vision grill—the fact that it meets the latest rigid requirements of A.G.A.

standards for safety, economy and efficiency—and the ten year guarantee that insures your investment.



For further information on the Barnes Better Bilt Gas Floor Furnace write today

BARNES HEATING & VENTILATING CO.

SALES OFFICE 330 E. FOURTH ST. LONG BEACH 2, CALIFORNIA

PERFORMANCE PLUS!

ATH-A-NOR

Furnaces and Parts

* * *

Performance is the yardstick for measuring the efficiency of any heating plant, and those that will operate year after year with little or no attention are the ones which will return you the most profit.

You're sure of top drawer performance when you install ATH-A-NOR Furnaces and parts exclusively. Over fifty years of furnace manufacturing experience guarantee you home heating plants with performance ratings and lasting qualities to satisfy the most critical clients. Investigate now . . . write for literature.

MAY-FIEBEGER COMPANY

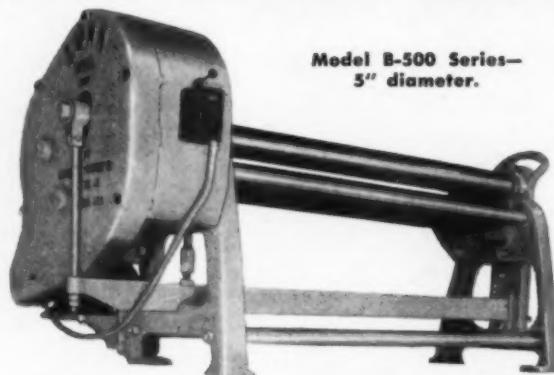
Manufacturers of Quality Heating Equipment
for Over Fifty Years.

Newark

Ohio

LOWN SLIP ROLL FORMING MACHINES

FIT YOUR JOB!



Model B-500 Series—
5" diameter.

If you want MORE PRODUCTION and ECONOMICAL OPERATION, use LOWN Slip Roll Forming Machines.

Our machines are designed for sturdiness and ease of operation to provide peak productivity.

Rugged — Rigid — Attractive — Prompt Deliveries.

The LOWN Slip Roll Forming Machines are built in a range of sizes from which you can choose the exact unit for your requirements.

SAN ANGELO FOUNDRY & MACHINE CO.

San Angelo, Texas E. Upton & SFE Tracks
Distributors in Most Principal Cities — Write for Bulletin.

plate (a) are extended into the die plate (d), while it is immobile in the opening in plate (e).

Operation of this die-set is feasible in any press, in a punch press or in a larger press, provided there is a sufficient size base. A block of hard wood is placed on top of the plate (a), protruding upwards above the shafts (c). The descending press plate (or ram in a press brake) strikes the block, marked (f) in the drawing, causing the plate (a) with the die (d) to strike the sheet interposed between (d) and (e). The rubber rings around the shafts (c) contract on the die (d) striking, and expand upon the block (f) being freed of pressure. This unit die-set can be positioned anywhere upon the middle portion of the press base, without bolting it down.

Nichols—

Waste Removal

(Continued from page 103)

Specifically, the New York code gives the following specifications for minimum size of branch pipes for emery, grinding and buffing wheels.

Branch Connections for Grinding Wheels

DIAMETER OF WHEEL	Maximum Wheel Surface (square inches)	Minimum Diameter of Branch Pipe (inches)
6" or less, not over 1" thick.....	19	3
Over 6" to 9" inclusive, not over 1½" thick.	43	3½

"Made-Rite"

DUCTS

•

SMOKE PIPE

•

FURNACE PIPE

•

FURNACE FITTINGS



You can save yourself time and money and make certain of well-tailored installations by contacting us for your pipe and fitting needs.

We are proud of our reputation and we want to help you fill your requirements with precision fittings . . . MADE-RITE. A postcard to us will bring you more information.

"Made-Rite" Co., Inc.
10th & Monroe St. Newport, Ky.

ROTEX
quick change
PUNCH



dial your size

That's right! Just turn the revolving turret head of ROTEX 18 to the size punch you need . . . 17 punches, 5/32" to 2", and 2" nibbling shears. Capacities, 10-12 gauge. Ready for action!

With ROTEX 18 you eliminate faulty set-up, punch-change delays, many operating accidents, extra cutting and filing operations. You turn out cleaner jobs faster, at increased profits.

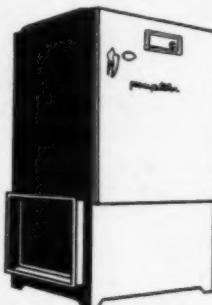
ROTEX punches are lowering costs in hundreds of small shops as well as in the giant plants of Fisher Body, Lockheed Aircraft, General Electric and other nationally known firms. Why not put ROTEX on the job in your sheet metal working, too?



Send for DESCRIPTIVE FOLDERS

PUNCH COMPANY
 4726 East 12th Street
 OAKLAND 1, CALIFORNIA

Sell *CLEAN AIR* *—the year 'round with* **RAYTHEON HOME PRECIPITATORS**



"Slack" seasons are eliminated for dealers selling their customers Raytheon Home Precipitators. These dealers can show how desirable clean air is the *year 'round*, how it's easily and economically maintained with this versatile unit . . . and they know they can *depend* on deliveries from Proie & Coogan. Investigate today, we'll be glad to send literature.

We are distributors in Pennsylvania for Raytheon Precipitators in the following counties: Erie, Crawford, Mercer, Lawrence, Beaver, Washington, Green, Fayette, Westmoreland, Allegheny, Butler, Vanango, Warren, McKean, Forest, Clarion, Armstrong, Somerset, Cambria, Blair, Clearfield, Elk, Cameron, Jefferson, Indiana.

PROIE & COOGAN HEATING CO.

WHOLESALE DISTRIBUTORS FOR INDOOR
 COMFORT SUPPLIES • ROOFING MATERIAL

6117 BROAD ST.

PITTSBURGH 6, PA.

MO ntrose 9300-01

Hit of the Machine Tool Show



NEW DESIGN
 NEW FEATURES

THE ECONOMY . . . FOOT POWER SHEAR

Capacity 30 to 52 inches. 18 ga. and lighter.

All steel welded construction, capacity to 18 ga. soft steel. Top knife bar strongly braced and provided with adjustable bronze gibs to compensate for wear. Blades of highest grade tool steel tempered and carefully ground to give maximum service before regrinding. Adjustable front and rear gauges, quickly set for different sizes. Spring actuated hold-down will clamp material firmly to the bed.

To Cut Material 30" Wide	\$210.00
To Cut Material 36" Wide	\$225.00
To Cut Material 42" Wide	\$300.00
To Cut Material 52" Wide	\$375.00

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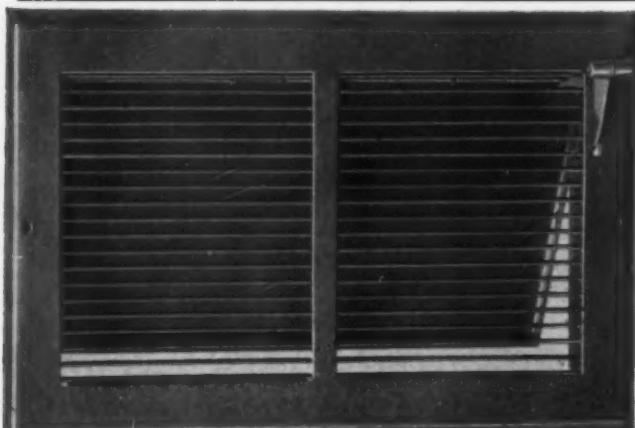
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If a wheel is thicker than given in the above table, it shall have a branch pipe not smaller than is called for by its wheel surface as above specified.

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Over 6" to 12" inclusive, not over 2" thick	75	4
Over 12" to 16" inclusive, not over 3" thick	151	4½
Over 16" to 20" inclusive, not over 4" thick	251	5
Over 20" to 24" inclusive, not over 5" thick	377	5½
Over 24" to 30" inclusive, not over 6" thick	565	6½

If a wheel is thicker than given in the above table it shall have branch pipes not smaller than is called for by its wheel surface as above specified. Buffing



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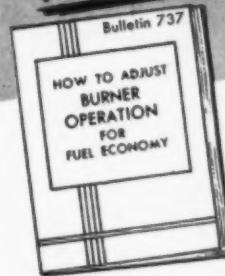
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wheels six (6) inches or less in diameter used for jewelry work may have 3" branch pipe.

Static suction at hoods specifications require that sufficient static suction shall be maintained in every branch pipe to produce a difference of level of at least 2 inches of water between two sides of a U shaped water gauge. The point at which test is made shall preferably be 10 diameters of the pipe from the hood, but in no case less than 1 foot from the hood. The test is made by placing one end of the rubber tube over a small hole made in the pipe, the other end of the tube being connected to one side of the water gauge. This test must be made with all branch pipe connections open and unobstructed. Balancing devices which are placed on the fan side of the test hole are not considered as obstructions. Test holes should preferably be drilled since a prick punch leaves an internal burr which is detrimental to accurate suction readings.

Duct Sizes

Common practice in determining duct sizes is to make the branches the same size as the throat opening at the hoods, with the main ducts so sized that their areas at any point are between 20 and 25 per cent greater than the sum of the areas of the hood connection served between the point in question and the dead ends of the mains. The New York code requires 20 per cent oversize in the mains serving polishing and buffing wheels.

The sum of the areas of the hood connections is known as "load Area" and on the basis of the above rule branches are made equal in area to the load area which they serve.

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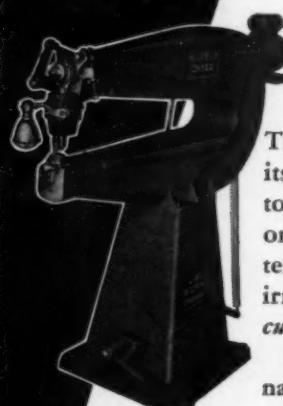
... That's the story behind the success of AMERICAN ARTISAN'S Annual Directory and Show Number to be published next January. Its completeness, accuracy and convenience have made it indispensable to engineers and contractors throughout the year for reliable reference in their buying and specifying work. Further information sent on request.

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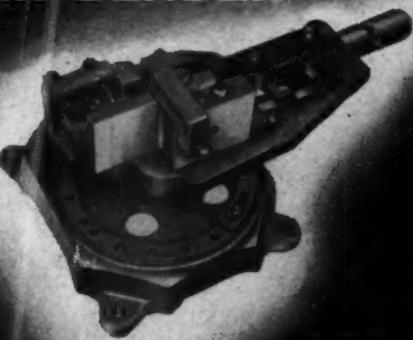
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Where the plant layout will permit, the fan and dust collector should be located at a central point, with main and branch ducts radiating to the various sections served. Equipment to be exhausted should be so arranged that in so far as possible short or large diameter branches are at the extremities of the duct system, while long or small diameter branches are near the exhaust fan. With scattered processes it is often advisable to separate the equipment to be cared for into several compact sections and provide a separate exhaust fan and duct system for each section. This arrangement of individual systems usually reduces the full load power consumption and also increases the flexibility of the plant. Processes that are normally operated in conjunction with each other should be included in a single group, and if there are a few machines which are much in use they can be tied into two separate duct systems with blast gates arranged to throw the load to either one as dictated by the plant operations. Multiple exhaust systems may be served by individual dust collectors or one large collector may take care of several systems. In the latter case back pressure valves must be provided in each duct system to prevent back flow of air when one or more systems of the group are shut down.

Ducts should be located so that they are readily accessible, do not interfere with free access to the equipment served, or the operations of cranes, conveyors, elevators, trucks, etc. They should also be placed where they will not be subject to injury by cranes, trucks, or other moving equipment. Locations condu-

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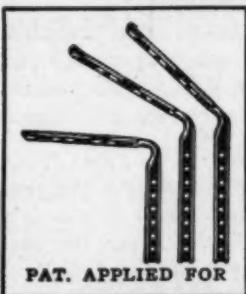
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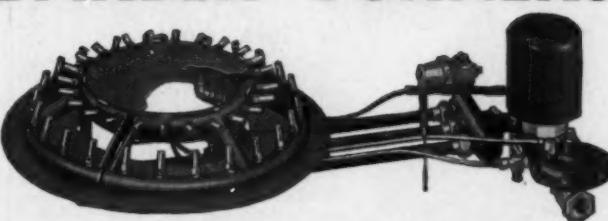
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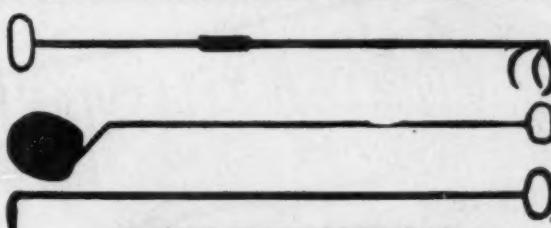
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cive to the condensation of moisture inside of the ducts are to be avoided. Underground duct locations are also to be avoided. Ducts should be spaced at least six inches above floors, where possible, and overhead ducts should be located close to the ceiling above.

Where large chips of heavy pieces of solid material may be carried along with the air stream into the duct system, it is advisable to install chip traps in the branch ducts, or they may be combined with the suction hoods. Chip traps which depend on expansion only for their effectiveness should have a cross section area of at least eight times the area of the ducts served. The automatic dumping type of trap is not recommended due to danger of excessive air leakage.

Ducts supplying return or replacement air should be located so that they do not cause excessive air motion near hooded processes. Return air ducts should also be arranged so that the workmen are not subjected to drafts of cold air.

Buffing and grinding wheel duct systems should be segregated as sparks from the grinding wheels may set fire to the lint and grease from the buffing operation, if both are carried through the same duct system.

Fire Prevention

The duct layout should be arranged so as to avoid passing through fire walls or important floors. This can sometimes be accomplished by placing the main duct on the outside walls of the building. Frequently vertical risers can be located in stair walls. Insurance regulations require that where ducts do pass through fire walls they be provided with automatic fire dampers on both sides of the wall. (For construction details

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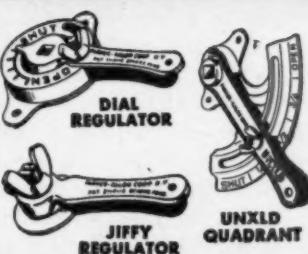
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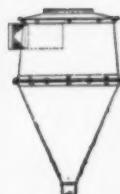
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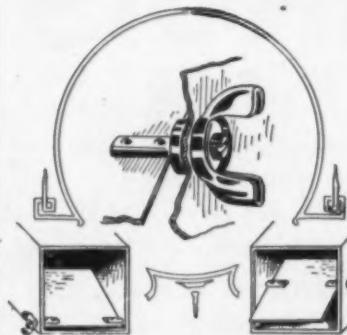
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of fire dampers see regulations published by National Fire Protective Association.)

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Of American Artisan, published monthly at Chicago, Ill., for Oct. 1, 1947.

State of Illinois, County of Cook—

Before me, a notary public in and for the state and county aforesaid, personally appeared F. P. Keeney, who, having been duly sworn according to law, deposes and says that he is the publisher of the American Artisan and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, and July 2, 1946 (embodied in section 537, Postal Laws and Regulations) printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
Publisher—F. P. Keeney, Chicago, Illinois.
Editor—John E. Peterson, Chicago, Illinois.
Managing Editor—John E. Peterson, Chicago, Illinois.
Business Manager—Chas. E. Price, Chicago, Illinois.

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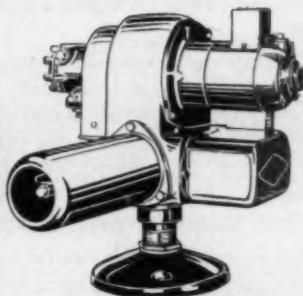


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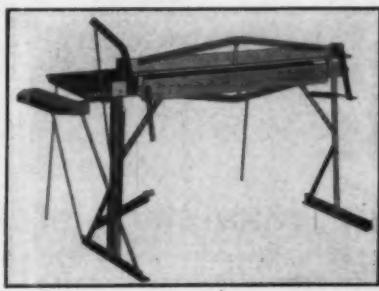
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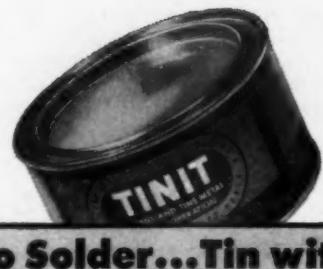
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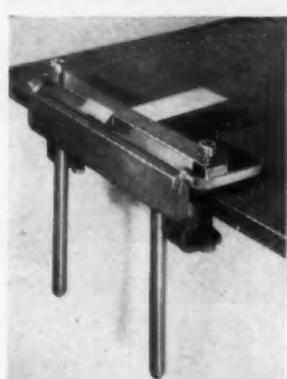
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Index to ADVERTISERS

Accurate Sheet Metal Mfg. Wks.	*	Fried Air-Kool Co.	151	Penn Electric Switch Co.	46
Acme Electric Welder Co.	181	Front Rank Furnace Co.	155	Penn Tool Co.	*
Acme Equipment Company	175	Furbro Co.	*	Perfection Stove Co.	*
Adams Co., The	181	G & S Machine Shop	186	Perfex Corp.	58
Aerofin Corp.	42	Gallaher Co.	182	Permanente Metals Corp.	138
Air Conditioning Exposition	169	Galvin Mfg. Co.	183	Petroleum Heat & Power Co.	25
Air Conditioning Products Co.	168	General Blower Co.	*	Petroleum Equipment Co.	*
Air Controls, Inc.	132	General Controls	25	Pioneer Tool Co.	183
Air Controls Products, Inc.	*	General Filters, Inc.	140	Potts-Farrington Co.	187
Inside Front Cover		Georgen-Mackwirth Co., Inc.	160	Premier Furnace Co.	159
Airborne Inds.	161	Gerett Corp., M. A.	173	Prole & Coogan Heating Co.	175
Airtemp Div. of Chrysler Corp.	63	Gilcor Products Corp.	183	Pryne & Co., Inc.	*
Airtherm Mfg. Co.	162	Gillen Co., J. L.	184	Quiet Automatic Oil Burner Corp.	*
A-J Mfg. Co.	165	Goege Mfg. Co.	184	Ralph Supply, Inc.	*
Ajax Furnace Fitting Co.	*	Grand Rapids Die & Tool Co.	171	Randall Graphite Bearings, Inc.	159
Aldrich Co.	146	Gray, G. L.	184	Raytheon Mfg. Co.	141
Allen Co., Inc., L. B.	181	Hall-Neal Furnace Co.	53	Rees Blow Pipe Mfg. Co.	*
Allied Building Credits	66 & 67	Harrington & King Perforating Co.	166	Register & Grille Mfg. Co., Inc.	*
American Brass Co.	127	Harris, A. R.	185	Reiner & Campbell Co., Inc.	*
American Machine Products	177	Hart & Cooley Mfg. Co.	20	Republic Steel Corp.	24
American Radiator & Standard Sanitary Corp.	57	Hart Oil Burner, Dept. of Avery Farm Machinery Co.	*	Research Products Corp. Outside Back Cover	
American Rolling Mill Co., The	113	Harvey-Whipple, Inc.	41	Revere Copper & Brass, Inc.	107
American Smelting & Refining Co.	29	Heatcraft Co.	179	Rheem Mfg. Co.	9
Anemostat Corp. of America	16	Heating & Ventilating Exposition	169	Richmond Radiator Co.	51
Armstrong Co., The	*	Heatway	*	Riverside Machine Company	171
Audel & Co.	187	Heil Co.	*	Rotary Concrete Drill Co.	176
Auer Register Co.	60 & 181	Henry Furnace Co., The	47	Rotex Punch Co.	175
Automatic Burner Corp.	*	Hess Warming & Ventilating Co.	*	Round Oak Co.	126
Automatic Furnace Co.	168	Hexdall Co., A. M.	179	Royal Heaters, Inc.	10
Automatic Humidifier Co.	48	Holly Mfg. Co.	17	Ruby Management Co.	*
Automatic Products Co.	108	Hotstream Heater Co.	150	Rudy Furnace Co.	*
Bacharach Industrial Instrument Co.	178	Howell Oil Burner Co., H. A.	185	Rybolt Heater Co.	21
Barber Colman Co.	37	Hussey & Co., C. G.	52	Ryerson & Son, Inc., Joseph T.	68
Barber Gas Burner Co., The	181	Illinois Bronze Powder Co.	184	Sampsel Time Control Co.	*
Barnes, Inc., H. C.	173	Independent Register Co.	141	San Angelo Fdry. & Machine Co.	174
Barth Mfg. Co.	*	Interstate Machinery Co.	*	Schaefer Brush Mfg. Co.	119
Bayley Blower Co.	181	Jackson & Church Co.	129	Schild Mfg. Co.	183
Berger Bros. Co.	181	Johnson Company, S. T.	*	Schwal Furnace Co.	186
Berger Mfg. Div. Republic Steel Corp.	22	Jones & Brown, Inc.	38 & 39	Schwarz Safe Co.	157
Bethlehem Steel Co.	50	Juniper Elbow Co., Inc.	*	Schwitzer-Cummins Co.	8
Beverly Shear Co.	170	Kehm Corp., The	167	Souilly Signal Co.	143
Bishop & Babcock	*	Kirk & Blum Mfg. Co.	185	Signal Electric Mfg. Co.	156
Black & Decker Mfg. Co.	12	Kling Bros. Engr. Works	157	Skilaw, Inc.	163
Bone Tool & Gauge Company	137	Knights Co., The James	179	Skuttle Mfg. Co.	148
Boston Machine Works Co.	*	Krauser-Boyd, Inc.	185	Smith & Son, Inc., Seymour	*
Brauer Supply Mfg. Co., A. G.	181	Kresky Mfg. Co.	44	Smith, R. E.	187
Breese Burners, Inc.	135	Krueger Sentry Gauge Co.	*	Standard Heating Equip. Co.	147
Brenner Co., Jacob	165	Lakewood Engr. Co.	166	Standard Elec. Mfg. Co.	*
Breuer Electric Mfg. Co.	*	Lau Blower Co.	124	Standard Stamping & Perforating Co.	*
Brooks Co., Inc., B. D.	187	Liberl Machine Co.	179	Stewart Mfg. Co.	153
Brundage Co.	147	Lincoln Electric Co.	142	Sundstrand Engr. Co.	186
Bryant Heater Co.	139	Lockformer Co.	13	Superior Products Co.	180
Burden Co.	*	Made-Rite Furnace Pipe & Fitting Co.	174	Surface Combustion Corp.	*
Carnegie-Illinois Steel Corp.	40	Maid-O'-Mist, Inc.	152	Swartwout Co.	5
Century Electric Co.	27	Majestic Co.	173	Synchronomatic Corp.	*
Century Engrg. Corp.	15	Maplewood Machinery Co.	168	Tennessee Coal, Iron & R. R. Co.	40
Certified Furnace Co.	*	Marshalltown Mfg. Co.	*	Thatcher Furnace Co.	123
Char-Gale Mfg. Co.	125	Maurey Mfg. Co.	163	Therm Oil Burner Co.	*
Cheney Inds.	182	May-Flebeger Co.	174	Thor Metal Prod. Co.	186
Cherry Blivet Co.	56	McDonnell & Miller, Inc.	*	Thor Tool & Die Co.	186
Chevrolet Motor Div. General Motors Corp.	33	Mercoid Corp., The	134	Timken-Detroit Axle Co.	*
Clarage Fan Co.	136	Meyer & Bro. Co., F.	*	Tintin Mfg. Co.	186
Clayton & Lambert Mfg. Co.	130	Mideo Register Corp.	176	Trade Winds Motor Fans, Inc.	169
Clean Sweep Co., The	182	Milcor Steel Co.	96	Trane Co.	*
Cleveland Humidifier Co.	171	Miller & Doing	185	Triangle Mfg. Co.	161
Cole-Sewell Engineering Co.	164	Milton Equipment Co.	173	Turnbull Mfg. & Dist. Co.	170
Coleman Co., Inc., The	*	Minneapolis-Honeywell Regulator Co.	*	Tuttle & Bailey, Inc.	65
Colson Equip. & Supply Co.	187	Inside Back Cover		Union Mfg. Co.	180
Columbia Burner Co., The	*	Morey, Dan	*	U. S. Air Conditioning Corp.	115
Columbia Steel Co.	40	Morrison Products, Inc.	*	United States Register Company	149
Combustion-The Steel Products Engrg. Co.	*	Morrison Steel Products, Inc.	111	United States Steel Corp.	40
Conco Engineering Works	43	Mt. Vernon Furnace & Mfg. Co.	183	United States Steel Export Co.	40
Condensation Engineering Corp.	155	Mueller Furnace Co., L. J.	32	United States Steel Supply Co.	40
Conner Engrg. Co., W. B.	*	Mulkey Co., J. F.	152	Utility Appliance Corp.	*
Coroaire Heater Corp.	*	National Metal Fabricators	175	Viking Air Conditioning Corp.	144 & 145
Cotta Transmission Corp.	172	National Super Service Co.	183	Viking Mfg. Co.	36
Crescent Parts & Equip. Co.	182	Nelson Corp., Herman	54 & 55	Wagner Awning & Mfg. Co.	166
Crescent Tool Co.	49	Niagara Furnace Div. of the Forest City Foundries Co.	*	Ward Machinery Co.	185
Dahlstrom Machine Works	182	Niagara Machine & Tool Works	158	Waterman-Waterbury Co.	80
Davis & Son Machine Works	*	Norge-Heat Div., Borg-Warner Corp.	23	Webster Electric Co.	64
Den Moines Stove Repair Co.	171	Northwestern Stove Repair Co.	164	Welton Steel Co.	35
Detroit Air Filter Co.	*	Nu-Way Corp.	*	Weldex, Inc.	*
Detroit Lubricator Co.	30	Ohio Electric Mfg. Co.	31	Wells Mfg. Co.	
Detroit Stamping Co.	*	Olsen Mfg. Co., C. A.	34	Western Engrg. Co.	185
Doyle Vacuum Cleaner Co.	172 & 187	Omaha Stove Repair Works	184	Wheeling Corrugating Co.	62
Dravo Corp.	*	Owens-Corning Fiberglass Corp.	128	White Mfg. Co.	176
Dreis & Krump Mfg. Co.	183	Packard Elec. Div., General Motors Corp.	*	Whitney Mfg. Co., W. A.	170
Dresser Industries (See Bryant Heater Co.)	*	Palmer Mfg. Co.	26	Whitney Metal Tool Co.	172
Elgo Shutter & Mfg. Co.	185	Parker Mfg. Co.	167	Williams Oil-A-Matic Division, Eureka Williams Corp.	133
Enderle, Inc., Ltd., Frank X.	182	Parker-Kalon Corp.	183	Williams-Wallace Co.	177
Famco Machine Co.	177	Patten Co., J. V.	*	Williamson Heater Co.	61
Field Control Div., H. D. Conkey & Co.	*	Peck, Stow & Wilcox Co.	154	Wilson & Co., Inc.	3
Fireline Stove & Furnace Lining Co.	*	Peerless Foundry Co.	151	Wilson, K. R.	14
Firewel Company, Inc.	178	Penn Boiler & Burner Mfg. Co.	*	Wise Furnace Co.	19
Fisher Brass Fdry.	*				
Fitzgibbons Boiler Co., Inc.	*				
Follansbee Steel Corp.	*				
Fraser	*				
Fraysn Co.	187				
Inside Back Cover					

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in other issues is marked with an asterisk.

46
58
138
28
183
187
150
175
*
*
159
141
*
*
24
Cover
107
9
51
171
176
175
126
10
*
*
21
68
6
174
119
183
186
157
8
143
156
163
148
*
187
147
*
*
153
186
180
18
*
5
40
123
*
186
186
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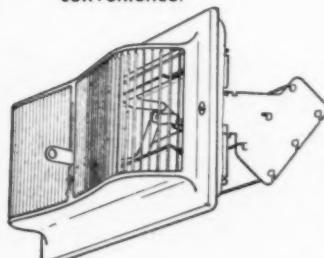


HONEYWELL REGISTER

gives you DRAFT-FREE DIFFUSION

DESIGN FEATURES

- 1. Balancing becomes a QUICK, ONE-MAN job.
- 2. Branch quadrants can be eliminated, when velocities are under 800 fpm.
- 3. Installation costs are drastically cut.
- 4. Smart new appearance and functional design.
- 5. No streaks on walls and ceilings.
- 6. Manual shut-off for fuel saving and convenience.



Self-contained volume dampers accurately meter the air with an adjustable lever at the register itself. Locking feature guards against unbalancing system.

EXCLUSIVE features of the new Honeywell Register give you *true, draft-free diffusion*. The gently curving lines, which enhance the register's appearance, assure even air diffusion throughout the room.

Fixed angle adjustable turning vanes—an integral part of the register—prevent turbulence of the air stream. Simplified one-man balancing and elimination of quadrants drastically cut installation costs and effect a saving of labor.

Take advantage of these features. Remember, *more profits for you* because of economical installation costs and less labor required.

Investigate the many advantages of this remarkable new register. Whether of the high or low wall type, you'll want to recommend it for every forced-warm-air installation.

It is now available through your wholesaler. Write today for complete information. Minneapolis-Honeywell, Minneapolis 8, Minn. In Canada: Toronto 12, Ontario. Branches and distributors in all principal cities.



more filter surface
effectively
EXPOSED!

THE WIRE GRID DESIGN means minimum obstruction of surface, as compared with conventional retainer design . . . thus assuring maximum effective filter area — and higher efficiency.

THE SELF-SEAL EDGE means no by-pass of unfiltered air . . . insuring greater efficiency of dust and pollen removal. (93% dust and 99% pollen removal efficiency.) Quicker, easier installation, too.

RESEARCH *Self-Seal* **AIR FILTERS!**



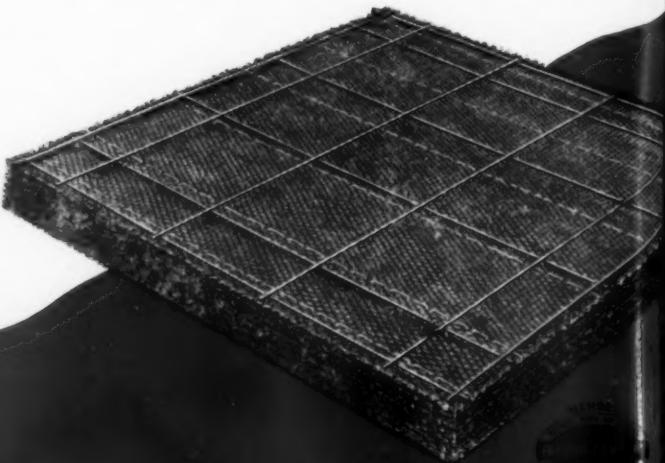
Free!

Catalog of filter sizes, and
list of dealers selling filters. Write

Research National
Advertising is telling
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**SEE YOUR FURNACE MAN AT
LEAST TWICE A YEAR**

Tie-in! Get your share of filter profits and the "inside track" afforded you to line up more heating, ventilating, air conditioning business.



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